



Corbettmaths

Ultimate
GCSE Higher
Revision
Question Booklet

Revision Video



Answers



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Adding & Subtracting Fractions - [Video 133](#)

1. Work out $\frac{5}{8} + \frac{1}{3}$

2. Work out $\frac{7}{15} - \frac{3}{10}$

3. Work out $5\frac{1}{4} + 1\frac{2}{5}$

.....

.....

.....

Multiplying Fractions - [Video 142](#)

4. Work out $\frac{1}{2} \times \frac{2}{3}$

5. Work out $\frac{3}{8} \times 1\frac{2}{5}$

.....

.....

Dividing Fractions - [Video 134](#)

6. Work out $\frac{3}{4} \div \frac{9}{10}$

.....

Reciprocals - [Video 145](#)

7. Write down the reciprocal of 20

.....

8. Write down the reciprocal of $\frac{1}{5}$

.....

9. Write down the reciprocal of $\frac{3}{8}$

.....

10. Write down the reciprocal of $7\frac{1}{2}$

.....

Arithmetic with Decimals - [Videos 90, 91, 92, 93, 94](#)

11. Work out $6.15 + 2.497$

12. Work out $7.3 - 2.542$

.....

13. Work out 0.9×0.012

.....

14. Work out $74.58 \div 5$

.....

15. Work out $14.6 \div 0.02$

.....

.....

Fractions, Decimals and Percentages - [Videos 129, 130](#)

16. Fill in the missing values

Fraction	Decimal	Percentage
$\frac{13}{40}$		
	0.085	
		280%
$\frac{2}{30}$		

Recurring Decimals - [Video 96a](#)

17. Circle the two fractions below that are recurring when converted to decimals.

$$\frac{4}{5} \quad \frac{2}{3} \quad \frac{1}{10} \quad \frac{7}{9} \quad \frac{3}{8}$$

Recurring Decimals - [Video 96](#)

18. Use algebra to write $0.\dot{3}\dot{8}$ as a fraction.

19. Use algebra to write $0.12\dot{7}$ as a fraction.

.....

Rounding - [Video 279a](#)

20. Round 294720 to 3 significant figures

.....

21. Round 0.45218 to 2 significant figures

.....

Use of a Calculator - [Video 352](#)

22. Calculate the value of $\frac{5}{0.8^3 - \cos(27^\circ)}$

.....

Estimation - [Video 215](#)

23. Estimate the value of $\frac{49.1 \times 40.4}{9.05 - 5.1}$

.....

Best Buys - [Video 210](#)

24. A shop sells the same type of highlighter in two different packs.
Pack A has 6 highlighters and costs £3.50
Pack B has 9 highlighters and costs £5.30

Which pack is better value for money?

Exchange Rates - [Video 214a](#)

25. Orla went to Spain.
She changed £425 into euros (€).

The exchange rate was £1 = €1.16

Change £425 into euros.

€.....

26. On her return to Belfast, Orla changed €80 into pounds (£).

The new exchange rate was £1 = €1.25

Change €80 into pounds.

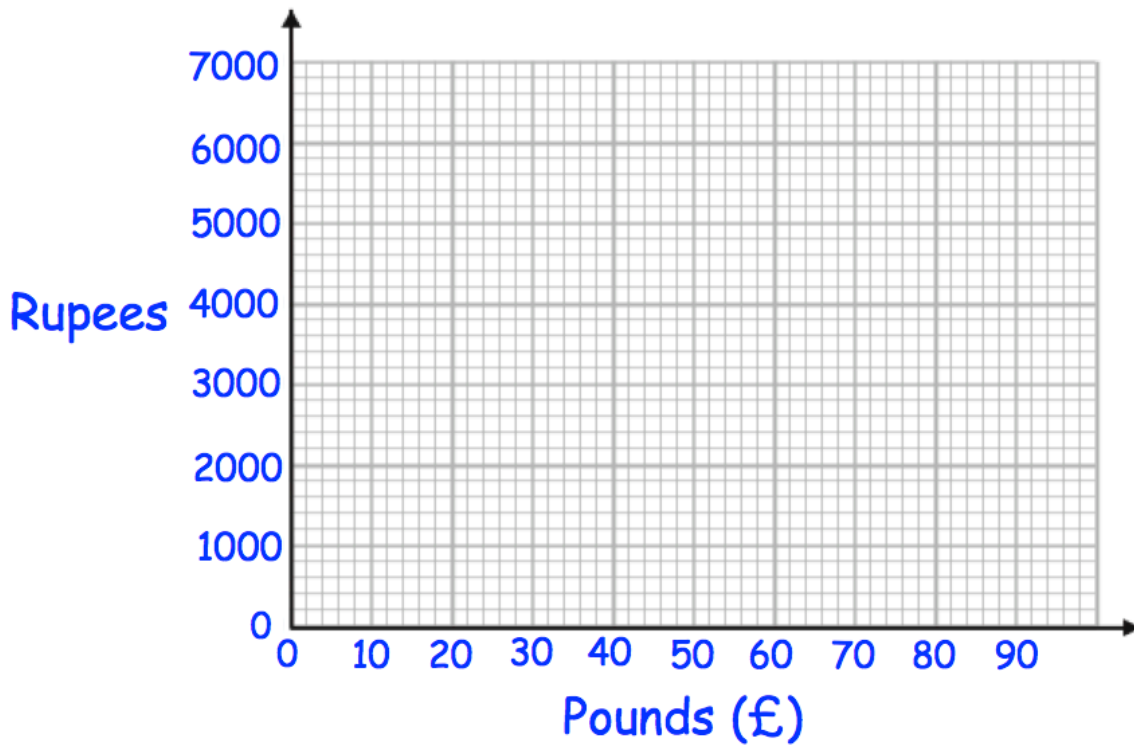
£.....

Conversion Graphs - [Videos 151, 152](#)

27. Complete the table below

Pounds	0	1	10	50
Rupees	0	90		

Draw a conversion graph for converting between pounds and rupees.



Indices - [Video 172](#)

28. Work out 2^4

.....

29. Calculate 9^4

.....

30. Write $6 \times 6 \times 6 \times 6 \times 6$ in index form

.....

Laws of Indices - [Video 174](#)

31. Write $2^3 \times 2^5$ in the form 2^n

.....

32. Write $5^{10} \div 5^2$ as a single power of 5

.....

33. Write $(10^6)^2$ in the form 10^n

.....

Negative Indices - [Video 175](#)

34. Work out 5^{-2}

.....

35. Work out 10^{-3}

.....

36. Work out $\left(\frac{2}{3}\right)^{-2}$

.....

Fractional Indices - [Video 173](#)

37. Work out $9^{\frac{1}{2}}$

.....

38. Work out $1000^{-\frac{1}{3}}$

.....

39. Work out $27^{\frac{2}{3}}$

.....

40. Work out $32^{-\frac{3}{5}}$

.....

LCM/HCF - [Videos 218, 219](#)

41. Find the lowest common multiple of 12 and 15

.....

42. Find the highest common factor of 18 and 45

.....

Product of Primes - [Video 223](#)

43. Write 20 as a product of primes.
Give your answer in index form.

.....

44. Write 48 as a product of primes.
Give your answer in index form.

.....

45. When a number is written as a product of primes, the answer is $2^2 \times 3^2 \times 5$
What was the number?

.....

Applying Product of Primes - [Video 223a](#)

46. A number, y , written as a product of primes is 5×7^2
Write the number $14y$ as a product of primes.

.....

47. Given that $120 = 2^3 \times 3 \times 5$

Find the lowest whole number that 120 would need to be multiplied by to give a cube number.

.....

Product of Primes - LCM/HCF - [Video 224](#)

48. Find the HCF and LCM of 48 and 60

HCF =

LCM =

Standard Form - [Videos 300, 301, 302, 303](#)

49. Write 700000 in standard form

.....

50. Write 28000 in standard form

.....

51. Write 0.094 in standard form

.....

52. Write 1.7×10^4 as an ordinary number

.....

53. Write 9.2×10^{-3} as an ordinary number.

.....

54. Write 450×10^5 in standard form.

.....

55. Work out $(3.8 \times 10^5) + (1.9 \times 10^6)$

.....

56. Work out $(6 \times 10^3) \times (4 \times 10^5)$
Give your answer in standard form.

.....

57. Work out $(4 \times 10^9) \div (5 \times 10^{-2})$
Give your answer in standard form.

.....

Expressing as a Percentage - [Video 237](#)

58. Josie scored 19 out of 20 in a test.

Write Josie's result as a percentage.

.....%

59. There are 29 students in a class.
6 of the students are left handed.

What percentage of the class are left handed?
Give your answer to 1 decimal place.

.....%

Percentages of Amounts (Non-Calculator) - [Video 234](#)

60. Work out 50% of 18

.....

61. Work out 10% of 350

.....

62. Work out 25% of 32

.....

63. Decrease 90 by 30%

.....

64. Work out 175% of 60

.....

Percentages of Amounts (Calculator) - [Video 235](#)

65. Work out 3% of 2800

.....

66. Work out 34% of 700

.....

Percentage Change - [Video 233](#)

67. Eoin bought an antique for €35
He sold the antique for €49

Work out the percentage profit

.....%

68. Last year, a football team sold 800 season ticket
This year, the team sold 745 season tickets

Calculate the percentage decrease.

.....%

Simple Interest - [Video 236a](#)

69. Niamh invests £500 for 2 years at 3% simple interest.
Work out how much interest Niamh earns at the end of the 2 years.

£.....

Multipliers - [Video 239](#)

70. Increase 120 by 10%

.....

71. Decrease 60 by 25%

.....

Compound Interest - [Video 236](#)

72. Fiona leaves £1600 in the bank for three years.
It earns compound interest of 4% each year.

Calculate the total amount Fiona has in the bank at the end of the three years.

£.....

Growth and Decay/Finance - [Video 236](#)

73. The value of a motorcycle was £14000 on 1st April 2020.
Every three months the value of the motorcycle decreases by 2% of its value at the start of that three months.

What was the value of the motorcycle on 1st April 2022?

£.....

Reverse Percentages - [Video 240](#)

74. The price of a chair is reduced by 20% in a sale.
The sale price of the chair is £20.80

What is the normal price of the chair?

£.....

75. A limited edition bag of sugar contains 35% more than a standard bag.
The limited edition bag contains 702g of sugar.

How much sugar is in the standard bag?

.....g

Simplifying Ratio - [Video 269](#)

76. Simplify the ratio 84 : 126

.....

Ratio: 1:n or n:1 - [Video 271c](#)

There are 180 red pens and 40 black pens in a box.

77. Write down the ratio of red pens to black pens in the box.
Give your answer in the form $n : 1$

.....

Forming Ratio - [Video 271c](#)

In a bag, there are red, yellow and blue sweets.
There are twice as many red sweets as yellow sweets.
There are three times as many blue sweets as red sweets.

78. Write down the ratio of the number of red sweets : yellow sweets : blue sweets

.....

Ratio & Fractions - [Video 269a](#)

The ratio of red to white counters in a bag is 3:5

79. What fraction of the counters are red?

.....

80. What percentage of the counters are white?

.....

81. Mark says that there are 72 counters in the bag.
Could Mark be correct?

.....

Sharing in a Ratio - [Video 270](#)

82. The ratio of adults to children on a flight is 17:3
There are 160 people altogether on the flight.

How many children are on the flight?

.....

Given One Quantity - [Video 271](#)

83. The ratio of the size of angle A to angle B is 4:9
Angle B is 72°

Find the size of angle A.

.....^o

Given Two Ratios - [Video 271a](#)

84. Given that $a : b = 2 : 3$ and $b : c = 5 : 1$

Find $a : b : c$

.....

Ratios and Equations - [Video 271a](#)

85. $y : x = 5 : 1$

Write an equation linking x and y .

.....

86. $x : y = 2 : 5$

Write an equation linking x and y .

.....

87. $y = 3x$

Write the ratio $x : y$

.....

Direct Proportion - [Video 254](#)

H is directly proportional to the cube of c .

When $H = 40$, $c = 2$.

88. Express H in terms of c .

.....

89. Find the value of H when $c = 5$

.....

Inverse Proportion - [Video 255](#)

q is inversely proportional to the square of t .

When $q = 7.5$, $t = 1.6$

90. Calculate the value of q when $t = 8$

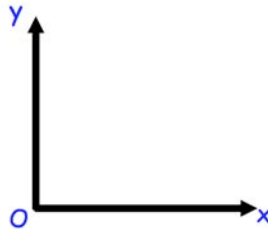
.....

91. Calculate the value of t when $q = 1.875$

.....

Proportion Graphs - [Video 254](#)

92. Sketch the graph of y is directly proportional to x^2 .



Proportion: Time - [Video 255c](#)

It takes 5 builders, 8 days to build a wall.

93. How long would it take 2 builders?

.....

94. State an assumption that you have made in working out your answer.

.....

Rounding (Highest/Lowest) - [Video 280](#)

There are 6300 jelly beans in a jar to the nearest hundred.

95. Write down the lowest possible number of jelly beans in the jar.

.....

96. Write down the greatest possible number of jelly beans in the jar.

.....

Error Intervals - [Video 377](#)

97. Jessica rounds a number, y , to the nearest hundred.
Her result is 2800.

Write down the error interval for y .

.....

Upper/Lower Bounds - [Video 183](#)

98. A rectangular rugby pitch has a width of 74m, measured to the nearest metre.
The length of the pitch is 115m, measured to the nearest 5 metres.

Calculate the upper bound for the perimeter.

.....m

Applying Bounds - Video 184

99. Felix has 8kg of sugar, correct to the nearest 100g.
Each cake he makes use 300g of sugar, correct to the nearest 10g.

What is the minimum amount of sugar that Felix could have left after making 6 cakes?

.....g

100. Sophie estimated that the distance between Glengormley and Newcastle is about 40 miles and that her average driving speed would be 60 mph.

She estimated the distance to the nearest 10 miles and the speed to the nearest 10 mph.

Calculate the upper bound of the time the journey should take.
Give your answer to the nearest minute.

.....minutes

Surds - [Videos 305](#), [306](#), [307](#), [308](#)

101. Work out $\sqrt{10} \times \sqrt{3}$

.....

102. Work out $\sqrt{5} \times \sqrt{20}$

.....

103. Work out $2\sqrt{3} \times 3\sqrt{5}$

.....

104. Work out $(\sqrt{5})^4$

.....

105. Work out $\frac{\sqrt{12}}{\sqrt{3}}$

.....

106. Simplify $\sqrt{63}$

.....

107. Work out $\sqrt{90} + \sqrt{1000}$

.....

108. Expand and simplify $(2 + \sqrt{3})(4 - \sqrt{3})$

.....

Rationalising Denominators - [Video 307](#)

109. Rationalise the denominator $\frac{2}{\sqrt{3}}$

.....

110. Rationalise the denominator $\frac{4 + \sqrt{5}}{3 - \sqrt{2}}$

.....

Product Rule for Counting - Video 383

At Corbett's Cafe there are

- 7 starters
- 16 main dishes
- 11 desserts

A meal voucher allows a customer to pick one starter, one main dish and one dessert for £10

111. How many different ways are there to choose a meal?

.....

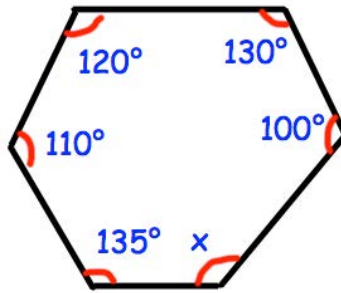
Three of the starters and four of the main dishes contain fish.
A different customer uses their meal voucher but they do not like fish.

112. How many different meal combinations can they choose?

.....

Angles (polygons) - [Video 32](#)

113. Find the size of angle x.



.....^o

114. Work out the sum of the interior angles for 18 sided polygon.

.....^o

115. The sum of the interior angles in a polygon is 3960°
Work out the number of sides the polygon has.

..... sides

116. Calculate the size of each interior angle in a regular polygon with 40 sides.

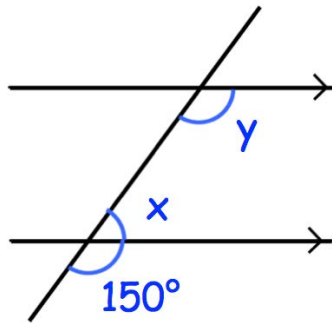
.....^o

117. Calculate the size of each exterior angle in a regular polygon with 45 sides.

.....^o

Angles in Parallel Lines - [Video 25](#)

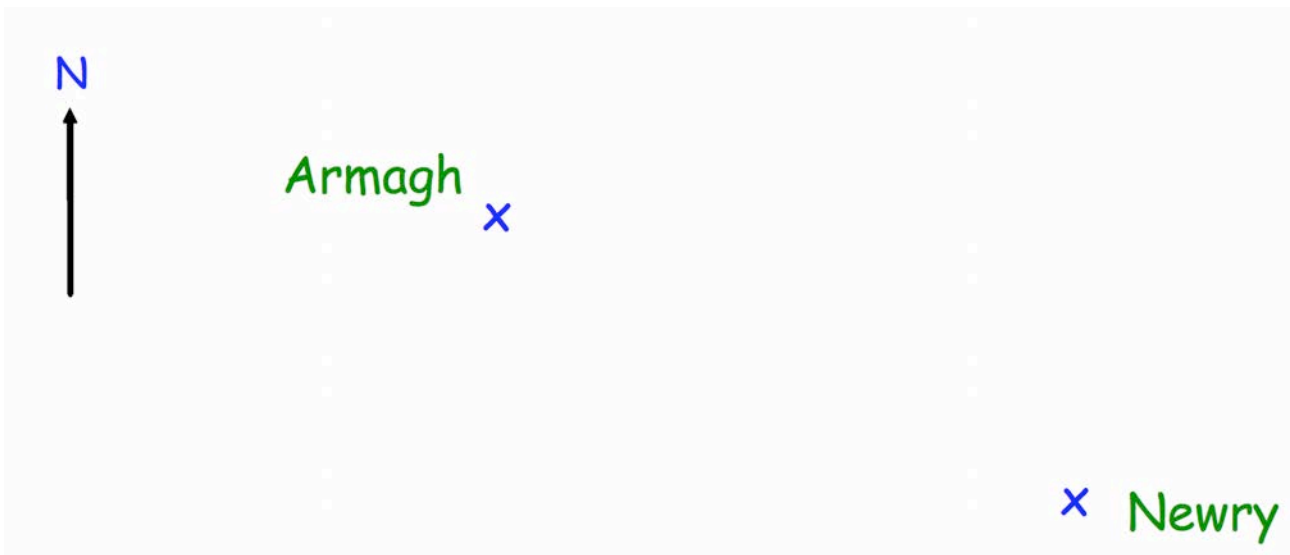
118. Find the sizes of angles x and y .



$x = \dots\dots\dots^\circ$ $y = \dots\dots\dots^\circ$

Bearings - [Video 26](#)

119. Write down the three figure bearing of Newry from Armagh



$\dots\dots\dots^\circ$



Omagh x

x Cookstown

120. Write down the three figure bearing of Omagh from Cookstown

.....°

Back Bearings - [Video 27a](#)

121. The bearing of town A from town B is 140°
What is the bearing of town B from town A?

.....°

Constructions - [Videos 78, 72, 79](#)

122. Use ruler and compasses to construct the perpendicular bisector of AB .
You must show clearly all your construction arcs.

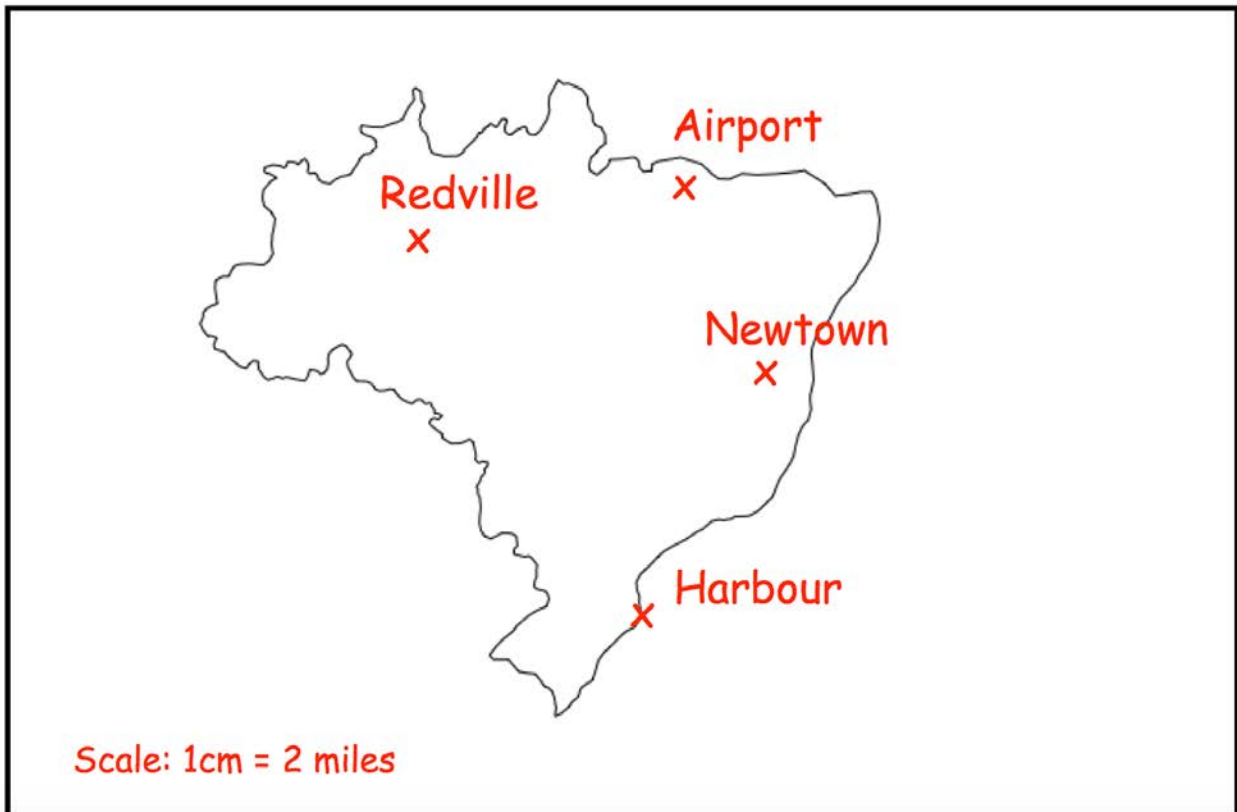
A .

. B

Loci - [Videos 75 to 77](#)

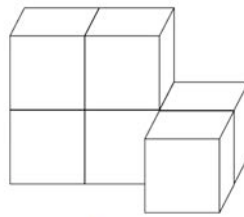
123. A farm is closer to Newtown than to Redville.
It is less 6 miles away from the Airport.

Shade the region on the map where the farm could be.

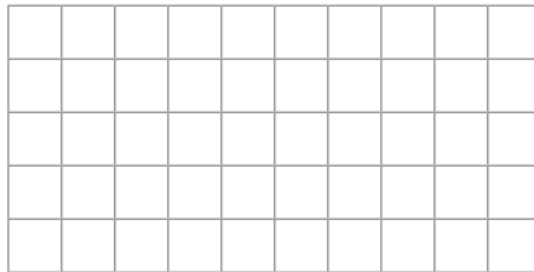


Views and Elevations - [Video 354](#)

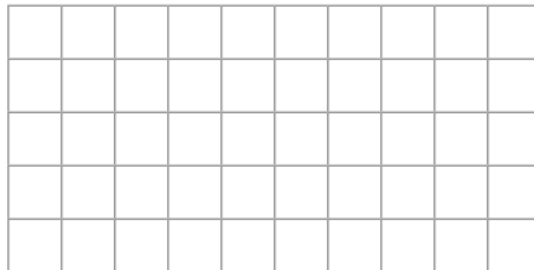
124. Shown below is a solid shape made from 6 centimetre cubes.



On the centimetre square grid, draw the front elevation.



On the centimetre square grid, draw the plan view.



Speed, Distance, Time - [Video 299](#)

125. A car travels 300 miles in 5 hours 40 minutes.
Work out the average speed of the car.
Give your answer to 1 decimal place.

.....mph

126. Richard runs at a speed of 8m/s for 25 seconds.
How far does Richard run?

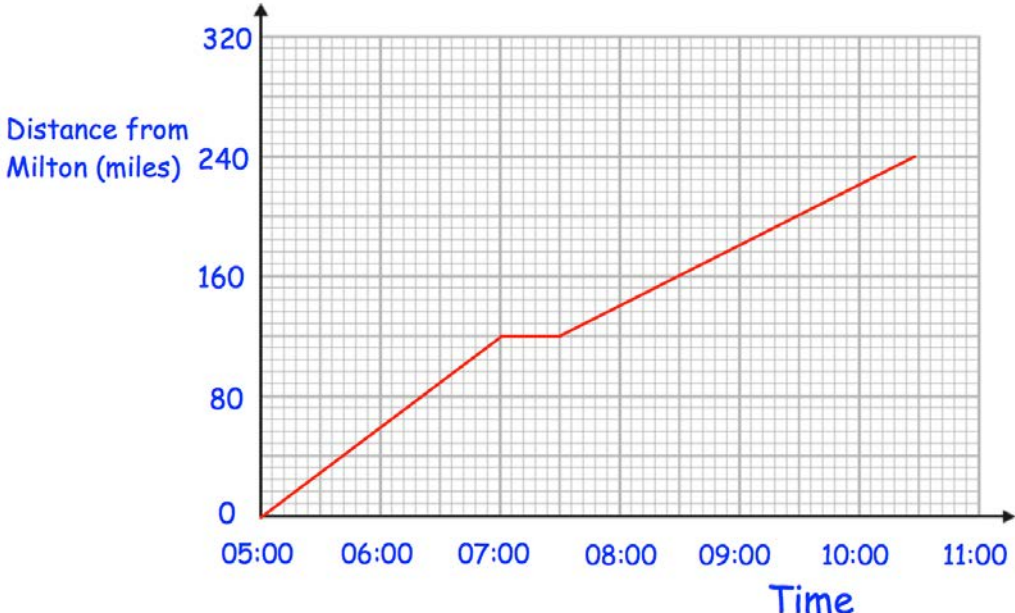
.....m

127. Paige drives 90 miles at a speed of 60mph.
How long does the journey take?

.....

Distance-Time Graphs - [Video 171](#)

A train travels from Milton to Redville, stops for 30 minutes and then travels to Leek.



128. How far is Redville from Milton?

.....miles

129. How long did it take the train to travel from Redville to Leek?

.....

130. Work out the average speed of the train for the journey from Milton to Redville

.....mph

Density - [Video 384](#)

131. A piece of aluminium has a mass of 575.4g and a volume of 210cm³

Calculate the density of the aluminium

.....g/cm³

132. A statue has a volume of 120cm³ and is made from zinc with a density of 7.14g/cm³

Calculate the mass of the statue

.....g

Pressure - [Video 385](#)

133. A cube with side length 8cm is placed on a table.
The cube exerts a force of 400N on the table.

Work out the pressure on the table in Newtons/cm²

.....N/cm²

Population Density - [Video 384a](#)

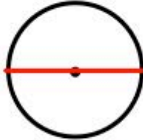



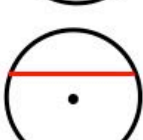
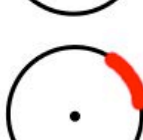
134. A town has a population density of 184 per km^2
The town covers an area of 72km^2

Work out the population of the town.

.....

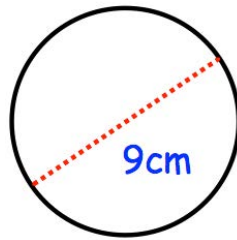
Parts of a Circle - [Video 61](#)

135.

Label	Diagram
Circle and radius	
Circle and segment	
Circle and arc	
Circle and diameter	
Circle and tangent	
Circle and chord	

Circumference - [Video 60](#)

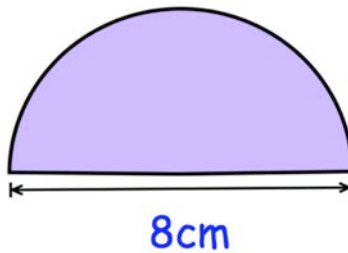
136. Calculate the circumference of this circle.
Give your answer to 1 decimal place.



.....cm

Perimeter of a Semi-Circle - [Video 243](#)

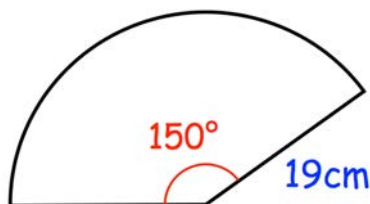
137. Calculate the perimeter of this semi-circle



.....cm

Arc Length - [Video 58](#)

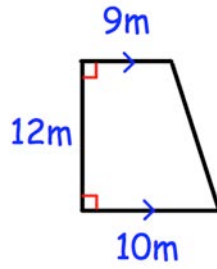
138. Find the perimeter of this sector.
Give your answer to 1 decimal place.



.....cm

Area of a Trapezium - [Video 48](#)

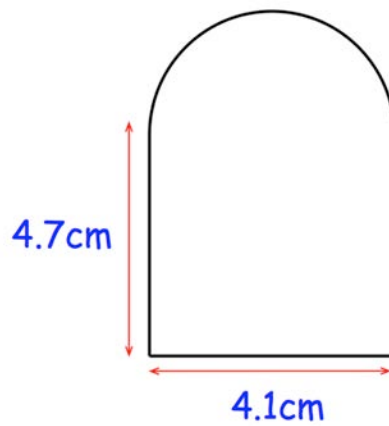
139. Calculate the area of the trapezium



.....m²

Area of Compound Shapes - [Video 41](#)

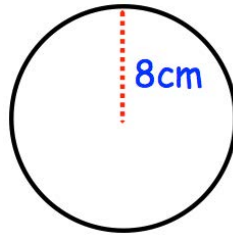
140. Calculate the area of this compound shape.



.....cm²

Area of a Circle - [Video 59](#)

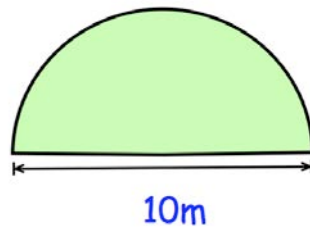
141. Calculate the area of this circle.
Give your answer to 1 decimal place.



.....cm²

Area of a Semi-Circle - [Video 47](#)

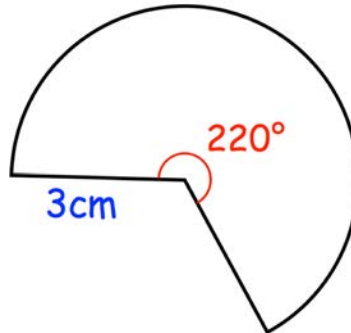
142. Calculate the area of this semi-circle



.....m²

Area of a Sector - [Video 46](#)

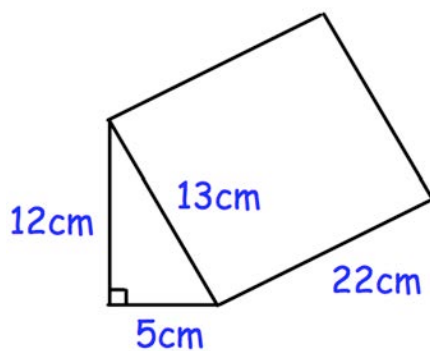
143. Find the area of this sector.
Give your answer to 1 decimal place.



.....cm²

Volume of a Prism - [Video 356](#)

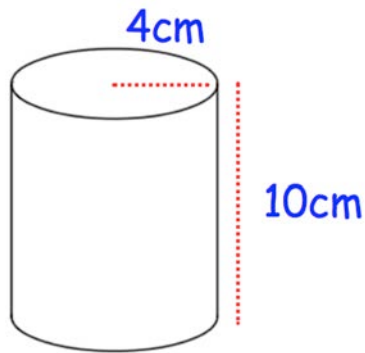
144. Calculate the volume of the triangular prism.



.....cm³

Volume of a Cylinder - [Video 357](#)

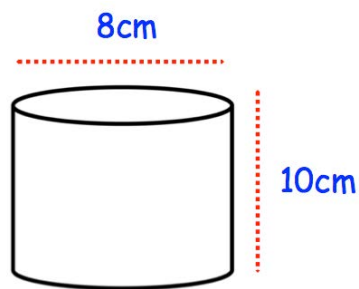
145. Calculate the volume of the cylinder.



.....cm³

In terms of Pi - [Video x](#)

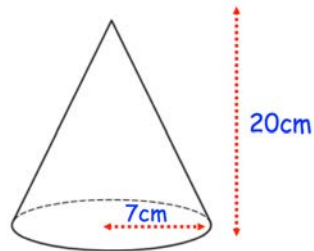
146. Calculate the volume of the cylinder.
Give your answer in terms of π



.....cm³

Volume of a Cone - [Video 359](#)

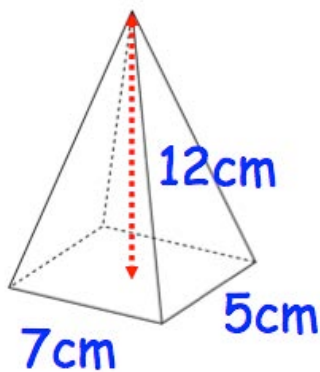
147. Calculate the volume of the cone.
Give your answer to 1 decimal place.



.....cm³

Volume of a Pyramid - [Video 360](#)

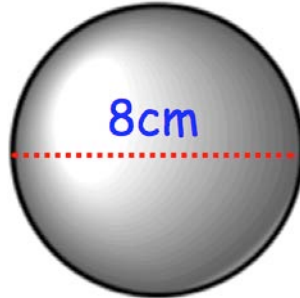
148. Work out the volume of the pyramid.



.....cm³

Volume of a Sphere - [Video 361](#)

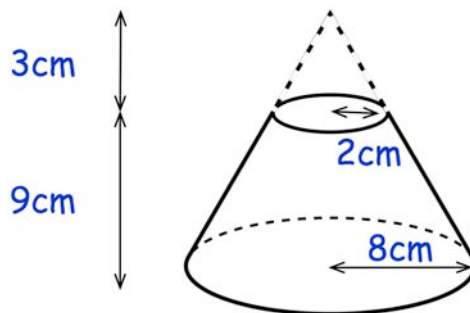
149. Calculate the volume of the sphere.
Give your answer to 1 decimal place.



.....cm³

Volume of a Frustum - [Video 360a](#)

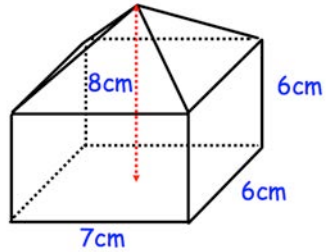
150. Find the volume of the frustum below.



.....cm³

Composite Solids - [Video 360](#)

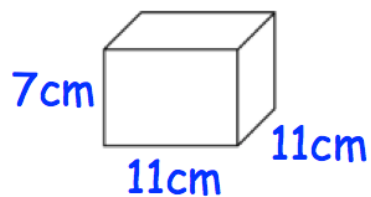
151. A solid glass paperweight is shown below.
The density of the glass used is 2.5g/cm^3
Work out the mass of the paperweight.



.....g

Surface Area - [Video 310](#)

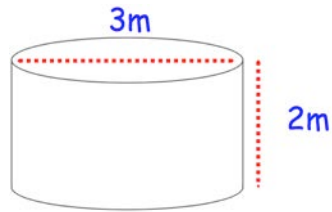
152. Work out the surface area of this cuboid.



..... cm^2

Surface Area of a Cylinder - [Video 315](#)

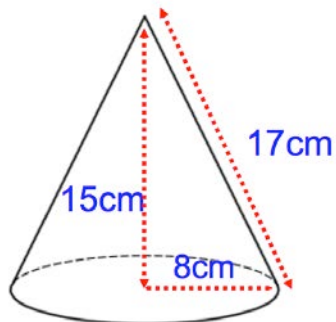
153. Calculate the surface area of the cylinder.
Give your answer to 2 decimal places.



.....cm²

Surface Area of a Cone - [Video 314](#)

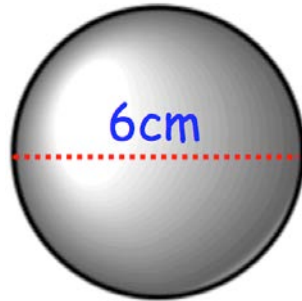
154. Calculate the surface area of the cone.
Give your answer to 1 decimal place.



.....cm²

Surface Area of a Sphere - [Video 313](#)

155. Calculate the surface area of the sphere.
Give your answer to 1 decimal place.



.....cm²

Converting Units for Area/Volume - [Videos 350, 351](#)

156. Write 7m² in cm²

.....cm²

157. Write 19000000cm³ in m³

.....m³

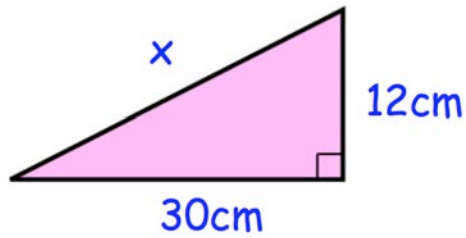
Imperial Units - [Videos 349a, 349b, 349c](#)

158. Given that 5 miles = 8 kilometres, convert 25 miles in kilometres

.....km

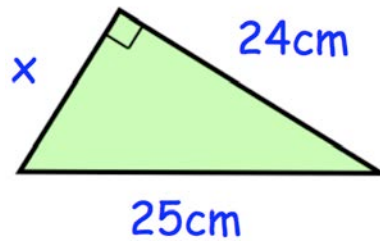
Pythagoras - [Video 257](#)

159. Find x .
Give your answer to 2 decimal places.



.....cm

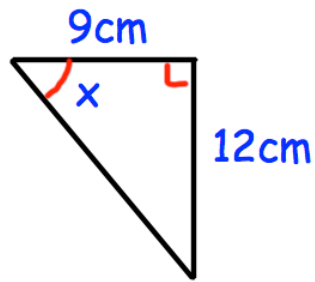
160. Find x .
Give your answer to 2 decimal places.



.....cm

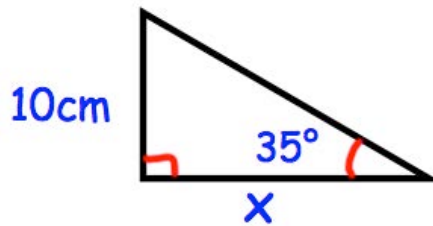
Trigonometry - [Videos 329, 330, 331](#)

161. Find x



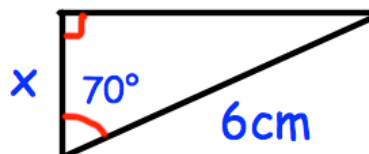
.....^o

162. Find x



.....cm

163. Find x



.....cm

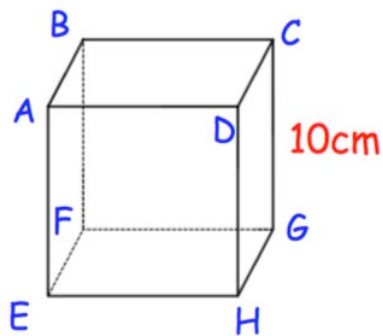
Exact Trig Values - [Videos 329, 330, 331](#)

164. Write down the value of $\cos 90^\circ$

.....

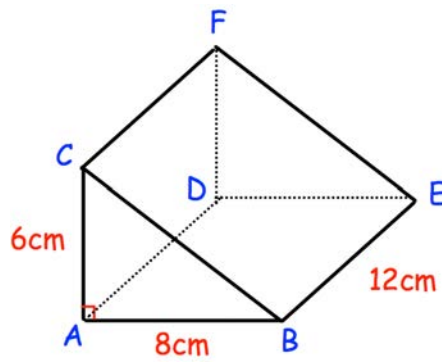
3D Trigonometry - [Video 332](#)

165. Shown below is cube $ABCDEFGH$.
Work out the size of angle CEG



.....°

3D Pythagoras - [Video 259](#)



166. Work out the length of BC

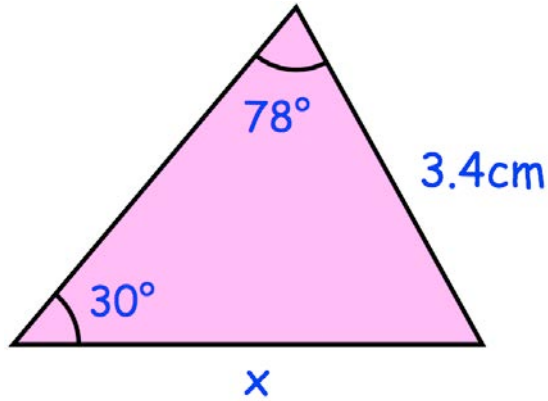
.....cm

167. Work out the length of BF

.....cm

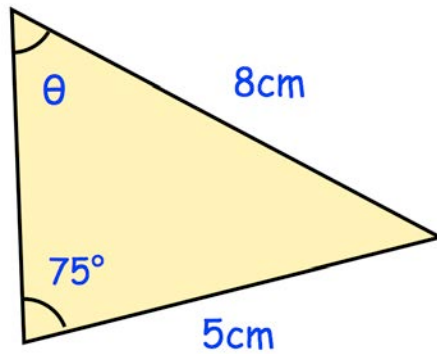
Sine Rule - [Videos 333, 334](#)

168. Find the size of x .



.....cm

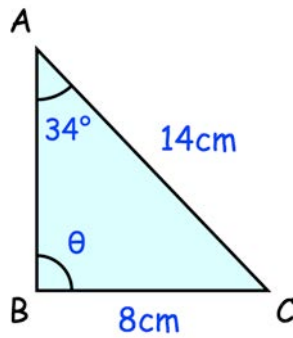
169. Find the size of θ .



..... $^\circ$

Ambiguous Case - [Videos 333, 334](#)

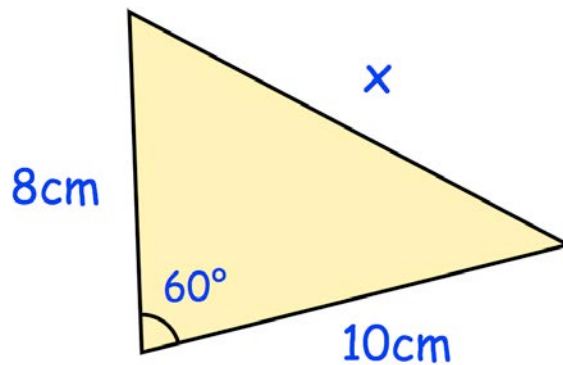
170. The triangle below has two possible value of θ
Find the size of these possible angles.
Give your answers to 1 decimal place.



..... $^\circ$ and $^\circ$

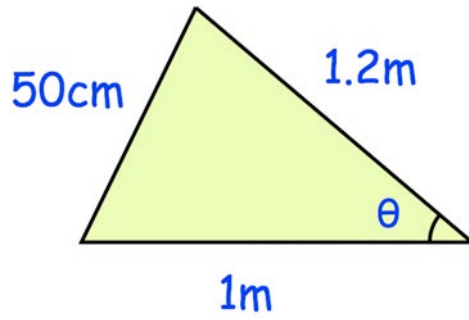
Cosine Rule - [Videos 335, 336](#)

171. Find the size of x.



.....cm

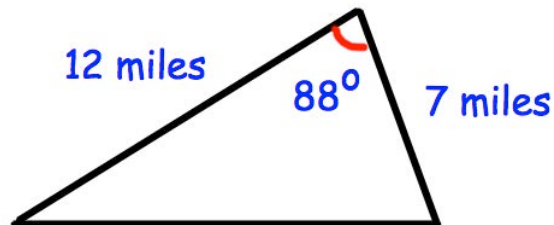
172. Find the size of θ .



.....^o

Area of any Triangle - [Video 337](#)

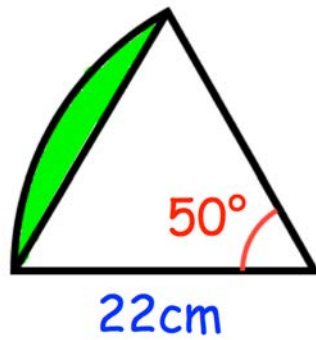
173. Calculate the area of the triangle below.



.....square miles

Area of a Segment - [Video 337](#)

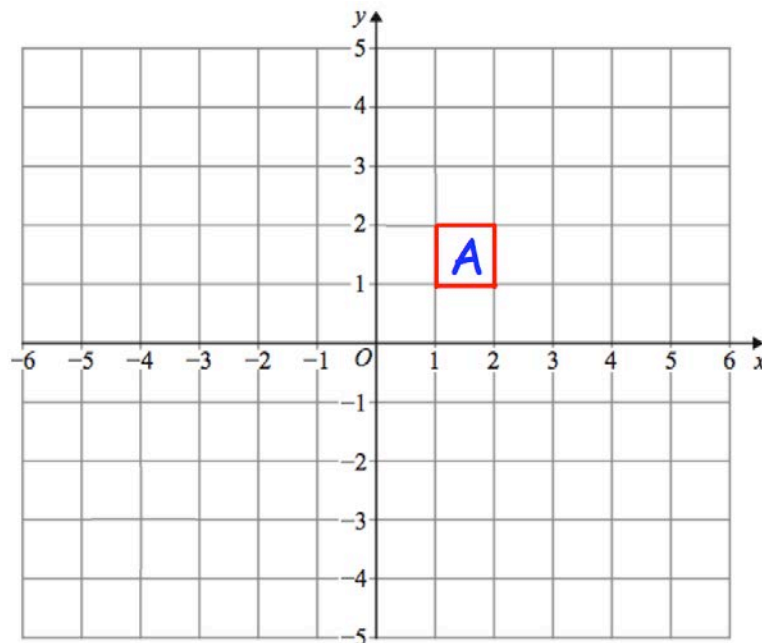
174. Calculate the area of the segment below.



.....cm²

Translations - [Video 325](#)

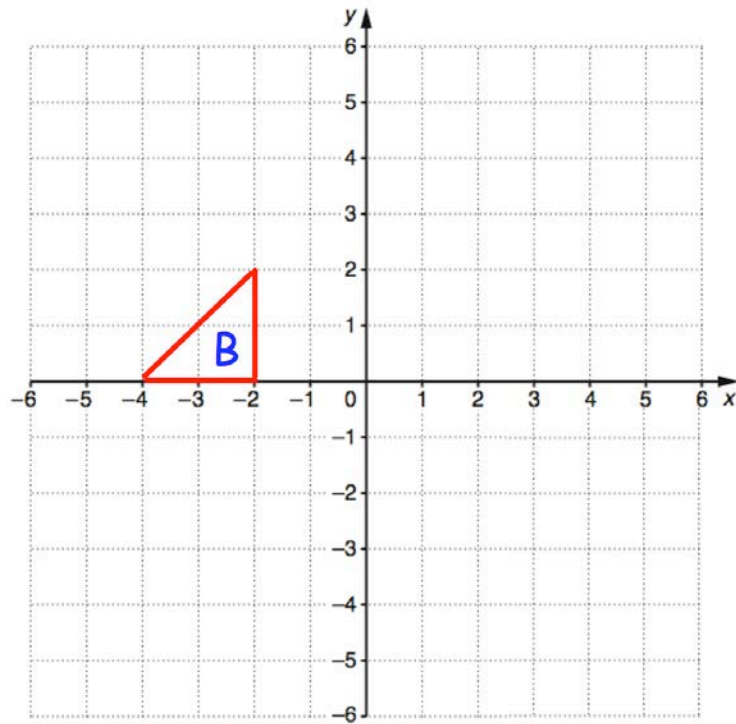
175.



Translate A by $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$

Rotations - [Video 275](#)

176.

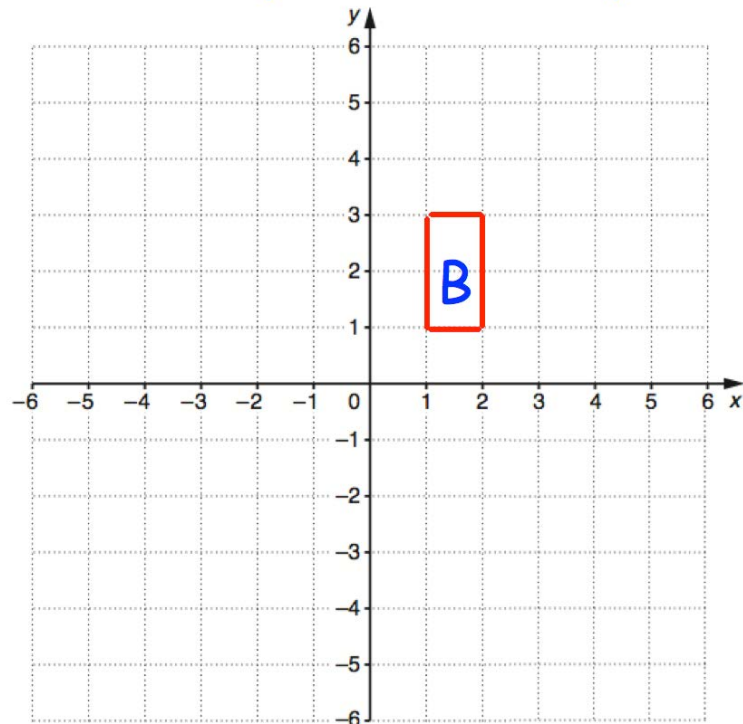


rotate 90° clockwise about $(-1, -2)$

Reflections - [Video 272](#)

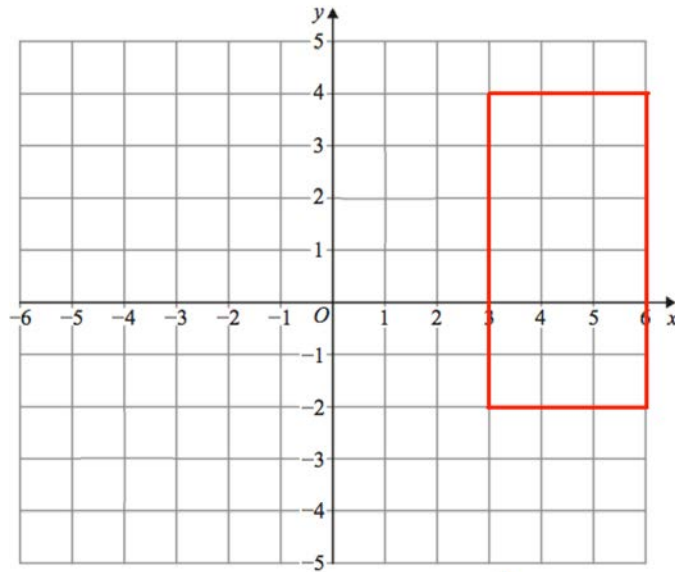
177.

Reflect shape B in the line $y = -x$



Enlargements - [Videos 104, 104a](#)

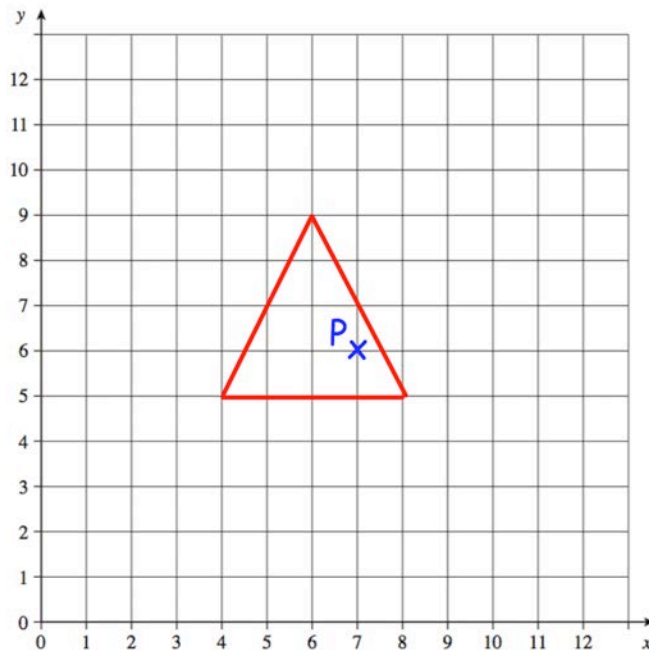
178.



Enlarge by scale factor $\frac{1}{3}$ using $(-3, 1)$ as the centre of enlargement

Negative Scale Factors - [Video 108](#)

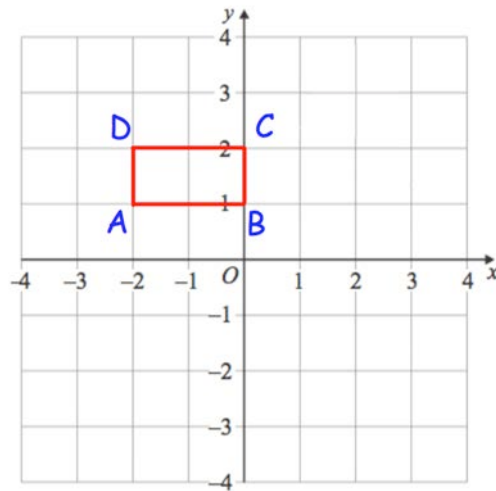
179.



Enlarge by scale factor -2

Invariant Points - [Video 392](#)

180. ABCD is enlarged by scale factor 2, with centre of enlargement $(-2, 2)$



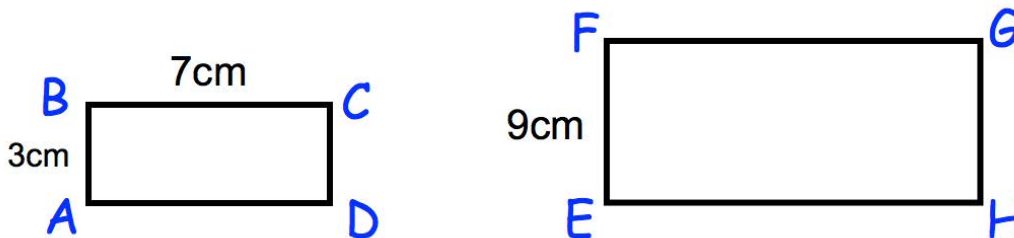
Which vertex is invariant?

.....

Similar Shapes - [Video 292](#)

181. Shown below are two mathematically similar rectangles

Not drawn accurately

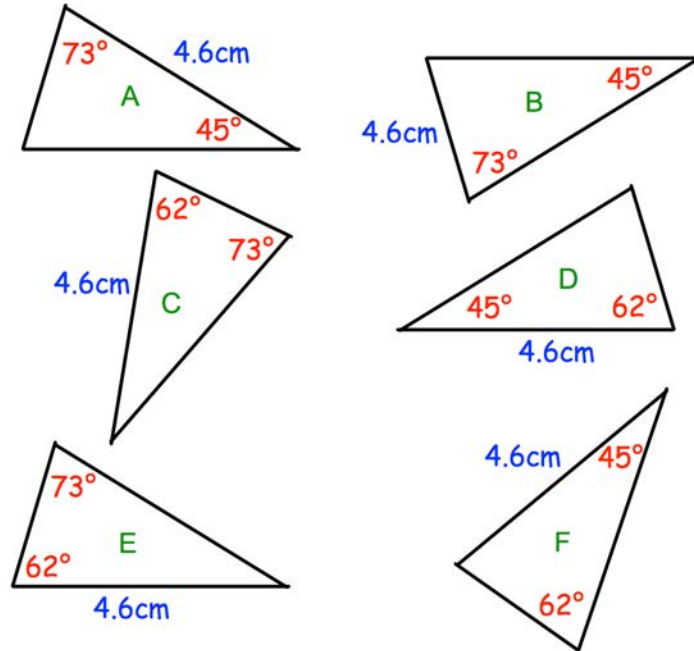


Find the length of FG

.....cm

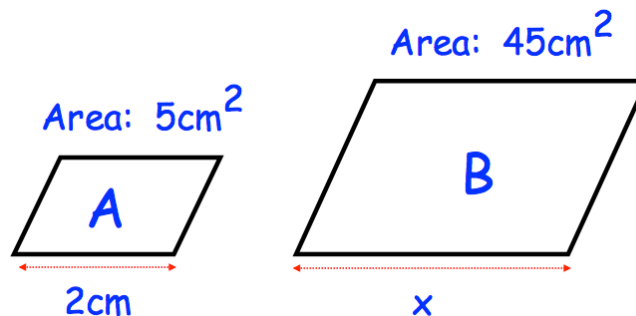
Congruent Triangles - [Video 67](#)

182. Shown are six triangles.
Which triangles are congruent?



Similar Shapes - [Video 293b](#)

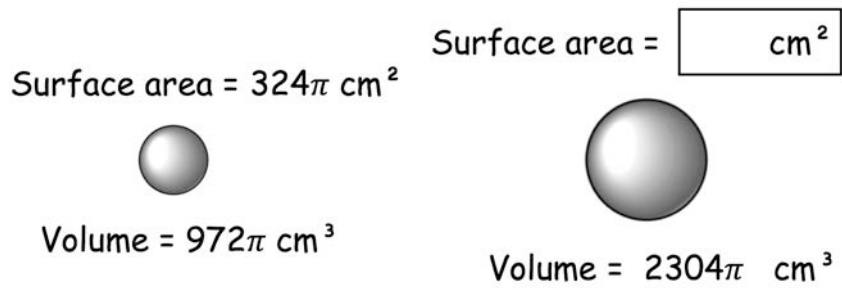
183. Shown below are two mathematically similar parallelograms.



Find x

.....cm

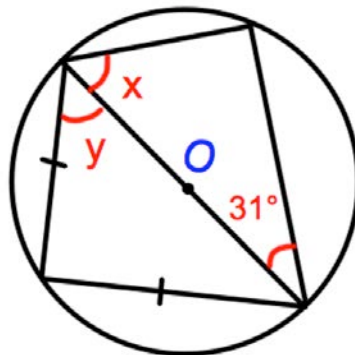
184. Find the surface area of the larger sphere.



..... cm^2

Circle Theorems - [Videos 64, 65](#)

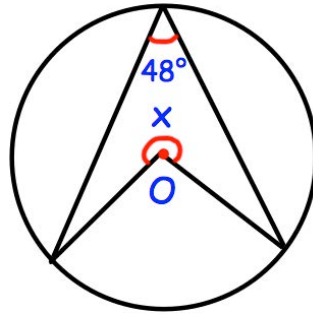
185. Find x and y



$x =$

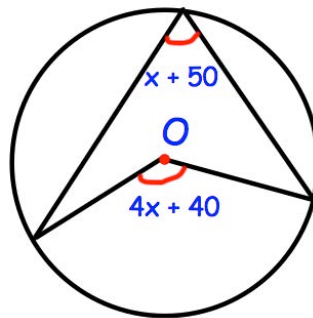
$y =$

186. Find x



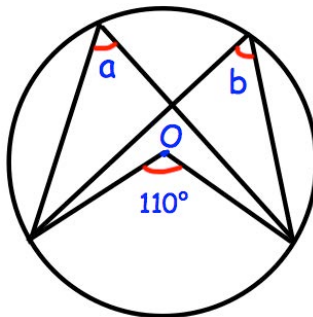
$x = \dots\dots\dots^\circ$

187. Find x



$x = \dots\dots\dots^\circ$

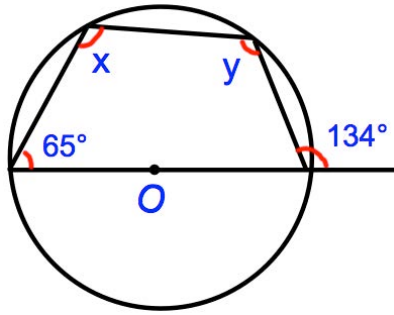
188. Find a and b



$a = \dots\dots\dots^\circ$

$b = \dots\dots\dots^\circ$

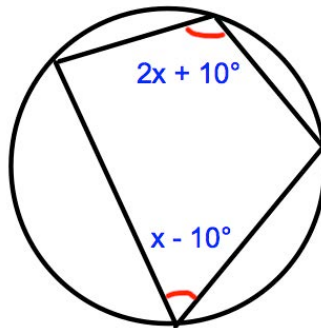
189. Find x and y



$x = \dots\dots\dots^\circ$

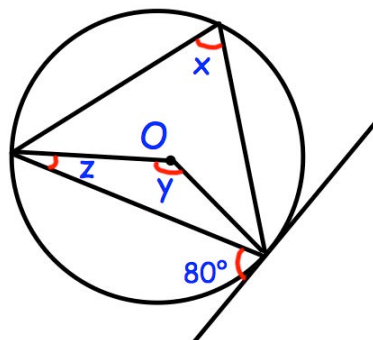
$y = \dots\dots\dots^\circ$

190. Find x



$x = \dots\dots\dots^\circ$

191. Find x , y and z

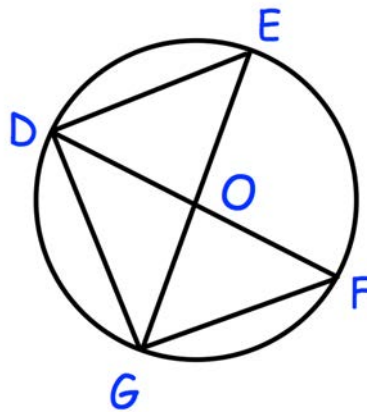


$x = \dots\dots\dots^\circ$

$y = \dots\dots\dots^\circ$

$z = \dots\dots\dots^\circ$

Geometric Proof - [Videos 64, 65](#)



192. O is the centre of the circle.
 DOF and EOG are diameters of the circle shown.
Prove triangles DEG and DFG are congruent.

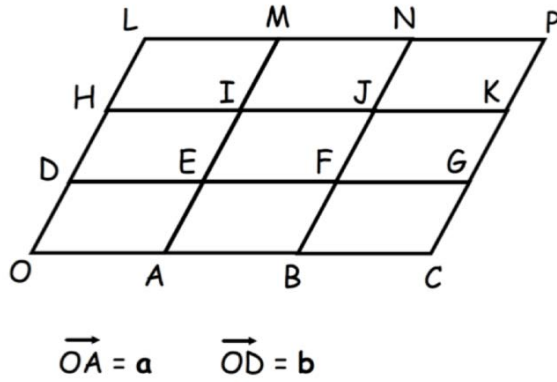
Column Vectors - [Video 353a](#)

193. $\mathbf{a} = \begin{pmatrix} 2 \\ 0 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} 1 \\ 5 \end{pmatrix}$

Work out $4\mathbf{a} + 2\mathbf{b}$

Vectors - [Video 353](#)

Shown below are 9 congruent parallelograms.



194. Write \vec{OI} in terms of \mathbf{a} and \mathbf{b}

.....

195. Show \vec{HM} and \vec{AK} are parallel

The line LIC is drawn.

196. Show LIC is a straight line.

Collecting Like Terms - [Video 9](#)

197. Simplify $8x + y - 5x - 5y$

.....

198. Expand and simplify $2(7x - 8y) - 3(x - 4y)$

.....

Substitution - [Video 20](#)

199. Given that $w = 3$ and $y = -9$

find the value of $7w - 2y$

.....

200. x is an odd number
 y is an even number

State if the following are odd or even

$x + y$

.....

xy

.....

Laws of Indices - [Video 174](#)

201. Simplify $w^{-4} \times w^7$

.....

202. Simplify $\frac{w^5}{w^{-8}}$

.....

203. Simplify $(w^4)^{-5}$

.....

Expanding Brackets - [Video 13](#)

204. Multiply out and simplify $2(x + 3) + 4(x - 1)$

205. Expand $3y^2(4y - 3)$

.....

.....

Expanding 2 Brackets - [Video 14](#)

206. Expand and simplify $(x - 12)(x - 3)$

.....

207. Expand and simplify $(5x + 4)(x - 2)$

.....

Expanding 3 Brackets - [Video 15](#)

208. Expand and simplify $(x - 1)(x + 3)(x + 5)$

.....

Factorising - [Video 117](#)

209. Factorise $4x^3 + 5x$

.....

Factorising Quadratics - [Video 118](#)

210. Factorise $x^2 - 6x - 55$

.....

211. Factorise $x^2 - 12x + 32$

.....

Factorising Harder Quadratics - [Video 119](#)

212. Factorise $3x^2 + 4x + 1$

.....

213. Factorise $2x^2 + 7x - 15$

.....

214. Factorise $6x^2 - 11x - 10$

.....

Difference between 2 Squares - [Video 120](#)

215. Factorise $x^2 - 4$

.....

216. Factorise $81 - x^2$

.....

Letters Both Sides - [Video 113](#)

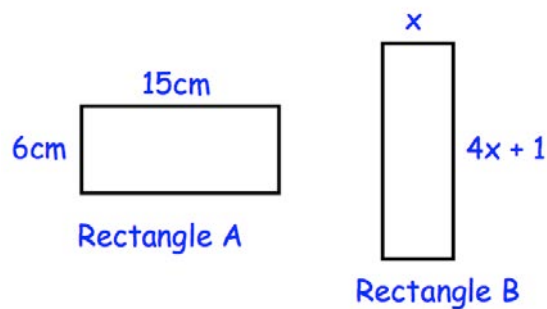
217. Solve $7x + 2 = 4x + 29$

$x =$

Forming Equations - [Videos 114, 115](#)

218. Both rectangles have the same perimeter.

Find the value of x .



.....

Solving Quadratics - [Video 266](#)

219. Solve $x^2 + 7x + 10 = 0$

.....

220. Solve $x^2 - 2x - 8 = 0$

.....

Quadratic Equations - [Video 266](#)

221. Solve $2x^2 + 7x - 4 = 0$

.....

222. Solve $4x^2 - 4x - 35 = 0$

.....

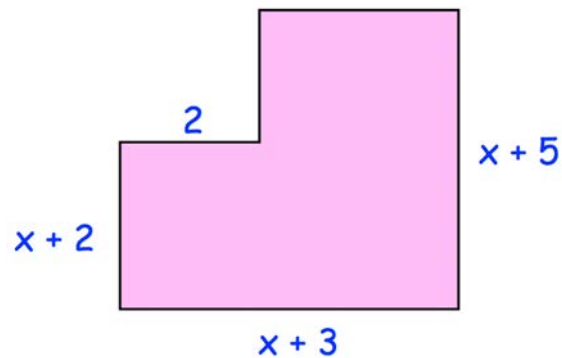
Quadratic Formula - [Video 267](#)

223. Solve $x^2 - 6x - 20 = 0$

Give your answers to 1 decimal place.

.....

Forming Quadratic Equations - [Video 266](#)



224. Writing an algebraic expression for the area of the shape

.....

225. Given that the area of the shape is 74cm^2 , form an equation and solve it to find x .

$x =$

Completing the Square - Video x

226. Write $x^2 + 6x - 20$ in the form $(x + a)^2 + b$ where a and b are integers.

.....

227. Use your answer to Q226 to solve $x^2 + 6x - 20 = 0$

.....

Changing the Subject - Video 7

228. Make x the subject of $m = 2x - y$

$x =$

229. Make w the subject of the formula $4(g + w) = 9w - 3$

$w =$

230. Make v the subject of $s = \frac{1}{2}(u + v)t$

$v = \dots\dots\dots$

Algebraic Fractions - [Videos 22 to 24](#)

231. Express $\frac{w}{3} - \frac{w + 2}{4}$ as a single fraction

$\dots\dots\dots$

232. Simplify fully $\frac{c - 2}{4} \times \frac{12}{2c - 4}$

$\dots\dots\dots$

233. Simplify $\frac{x^2 + 8x}{x^2 + 10x + 16}$

$\dots\dots\dots$

234. Simplify fully $\frac{v+3}{15} \div \frac{v^2+3v}{25}$

.....

Equations - [Video 111](#)

235. Solve $\frac{3x+5}{4} - \frac{x-7}{5} = 1$

236. Solve $\frac{2x-3}{4} + \frac{3x+1}{5} = \frac{11}{5}$

.....

.....

Harder Equations - Videos 111, 111a

237. Solve $\frac{3}{x-1} + \frac{4}{x+5} = \frac{1}{3}$

.....

238. Solve $\frac{2}{2x-1} + \frac{1}{x-2} = 1$

.....

Identities - Video 367

239. Work out the values of a and b in the identity

$$4(6x + 5) + 4(2x + b) \equiv ax - 8$$

a =

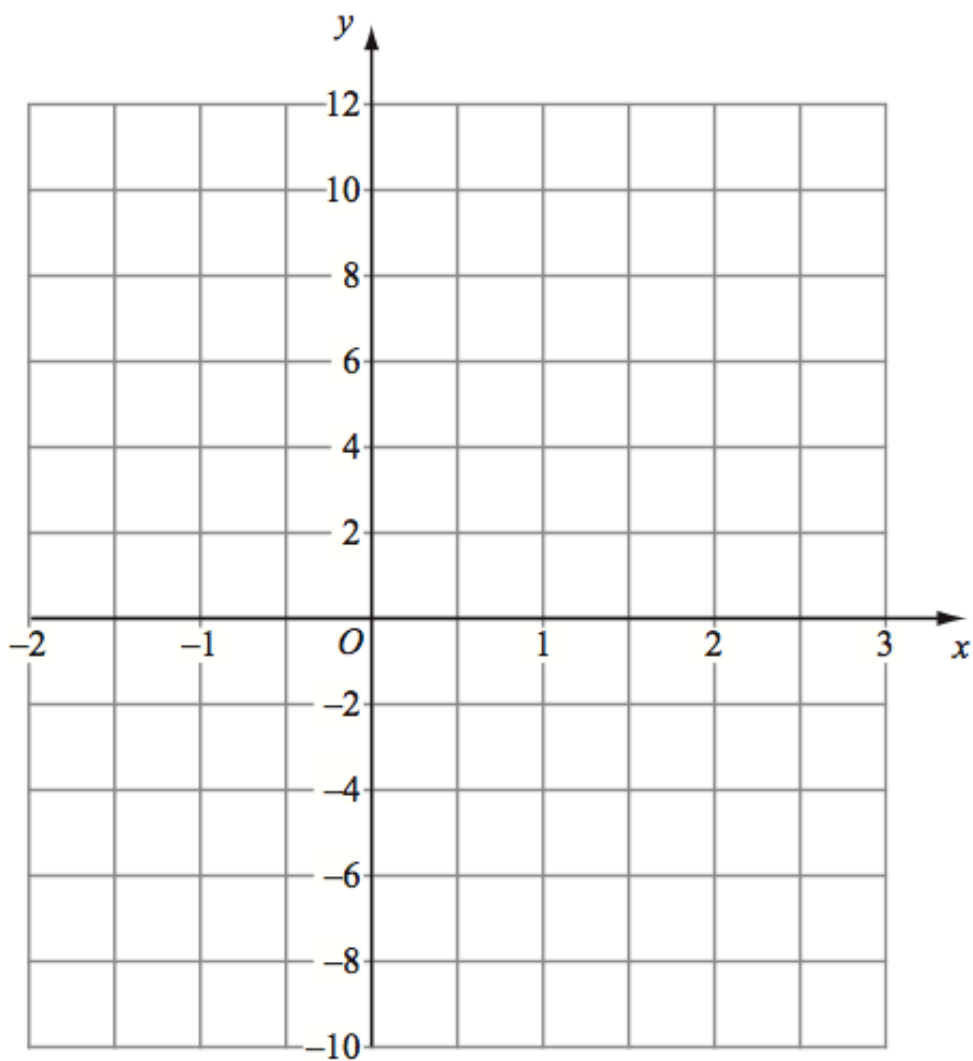
b =

Drawing Linear Graphs - [Video 186](#)

240. (a) Complete the table of values for $y = 2x + 4$.

x	-1	0	1	2	3
y		4			10

(b) On the grid, draw the graph of $y = 2x + 4$ for values of x from -1 to 3 .

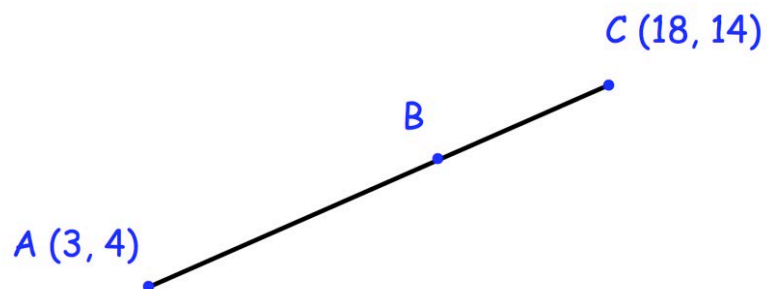


Midpoint of a Line - [Video 198](#)

241. $A(3, -2)$ and $B(7, 10)$

Find the coordinates of the midpoint of AB

Coordinates and Ratio - [Video](#)

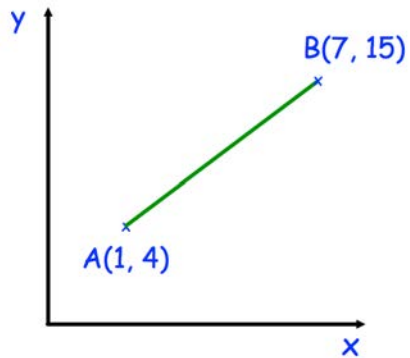


242. ABC is a straight line.
 $AB : BC = 3 : 2$

Work out the coordinates of the point B .

Length of a Line - [Video 263](#)

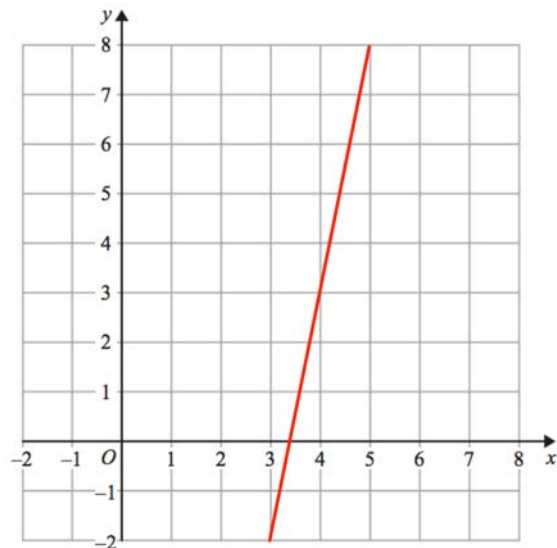
243. Shown below are the points $A(1, 4)$ and $B(7, 15)$



Calculate the length of the line joining A and B.

Gradient - [Video 189](#)

244. Find the gradient of the line below



Equation of a Line - [Videos 186 to 195](#)

245. A straight line has equation $y = 5x - 2$

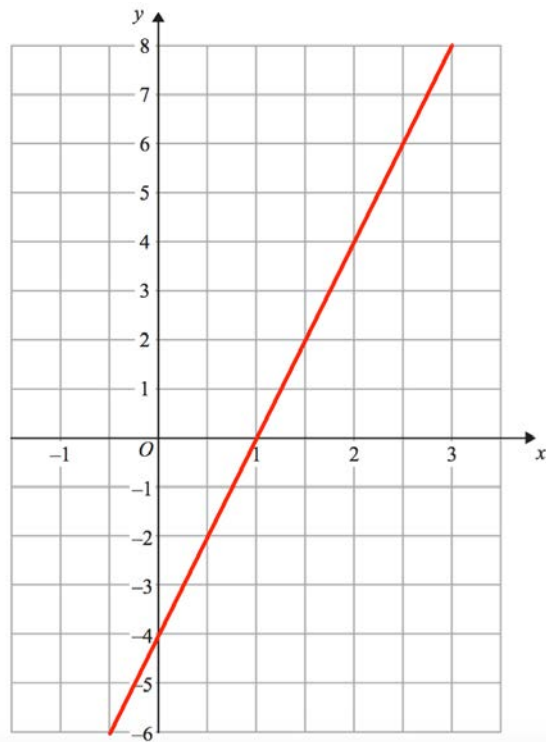
(a) What is the gradient of the line?

.....

(b) Write down the coordinates of the y-intercept

.....

246. Find the equation of the line below



.....

247. A straight line has a gradient of -2 and passes through the point $(1, 10)$.

Write down the equation of the line.

.....

248. Find the equation of the straight line that passes through the points $(0, 3)$ and $(4, 11)$

.....

249. Find the equation of the straight line that passes through the points $(-8, -10)$ and $(0, 14)$

.....

Parallel Lines - [Video 196](#)

250. Write down an equation of a line parallel to $y = 6x + 5$

.....

251. Write down the equation of the line parallel to $y = 3x + 1$ that passes through the point $(0, 2)$

.....

Perpendicular Lines - [Video 197](#)

252. Write down an equation of a line perpendicular to $y = 2x + 9$

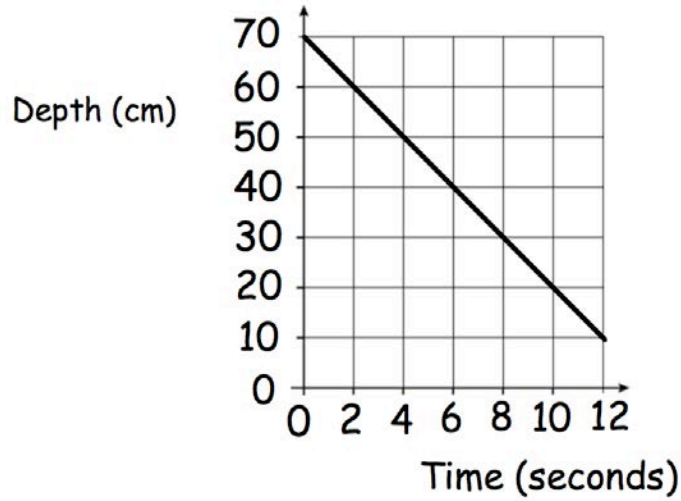
.....

253. Write down the equation of the line perpendicular to $y = 3x + 1$ that passes through the point $(6, -5)$

.....

Real Life Graphs - [Video 171a](#)

254. The graph below shows the depth of water in a container.



Calculate the gradient of the line

.....

What does the gradient of the line represent?

.....

.....

Simultaneous Equations - [Video 295](#)

255. Solve the simultaneous equations

$$2x + 4y = 26$$

$$3x - y = 4$$

$x =$ $y =$

256. Solve the simultaneous equations

$$3x + 2y = 16$$

$$2x - 3y = 2$$

$$x = \dots\dots\dots y = \dots\dots\dots$$

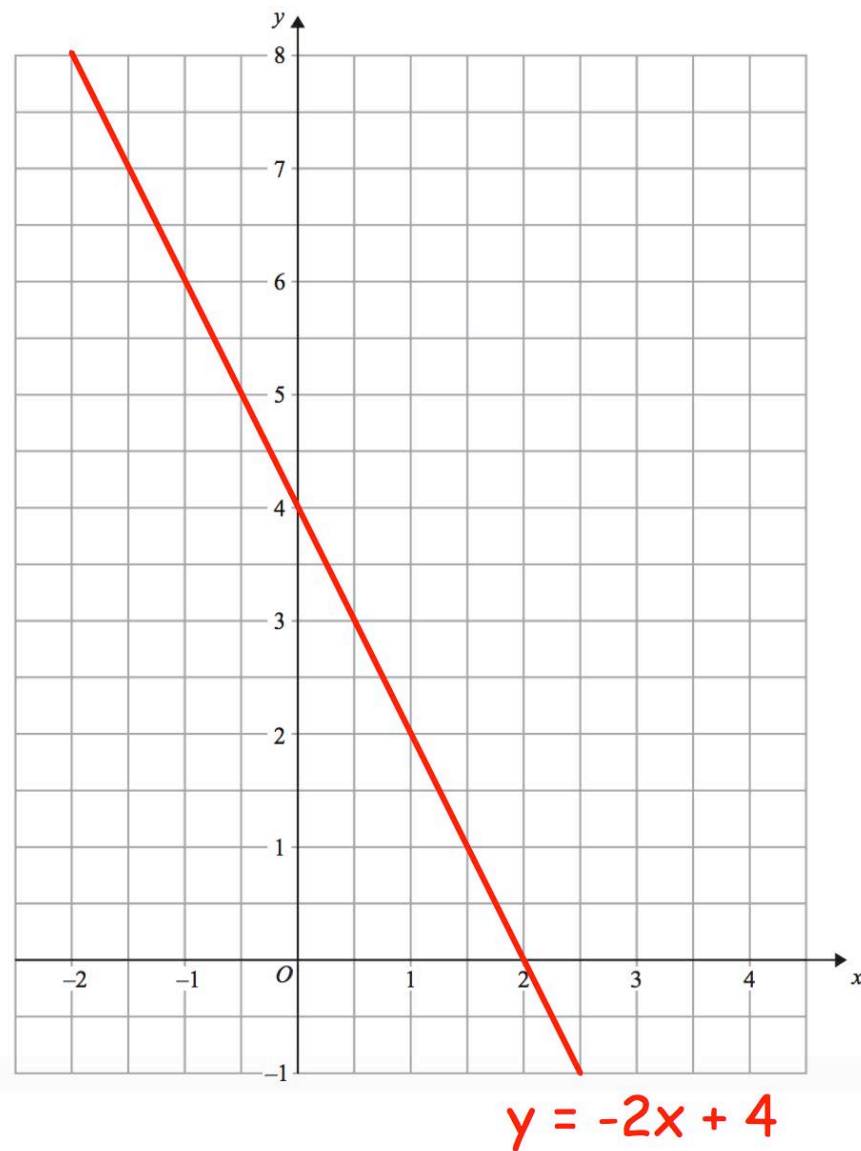
257. Three bananas and two pears cost 95p.
Five bananas and three pears cost £1.51

Find the cost of ten bananas and ten pears.

$$\pounds \dots\dots\dots$$

Graphical Solutions - [Video 297](#)

258. The straight line $y = -2x + 4$ has been drawn on the grid.



By drawing a suitable line, solve the simultaneous equations

$$y = -2x + 4$$

$$y = x + 1$$

$x = \dots\dots\dots$ $y = \dots\dots\dots$

Non-Linear Simultaneous Equations - [Video 298](#)

259. Solve the equations

$$y = x + 3$$
$$y = x^2 + 5x - 2$$

.....

Equation of a Circle - [Video 12](#)

The equation of a circle C , with centre O , is:

$$x^2 + y^2 = 289$$

260. Write down the coordinates of the centre of the circle, O .

.....

261. Find the radius of C .

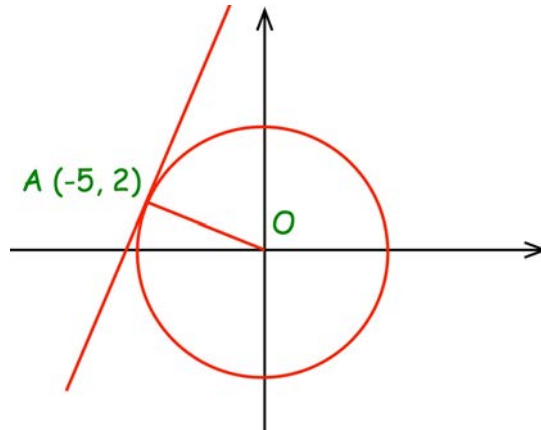
.....

262. Show the point $(8, 15)$ lies on C .

.....

Equation of a Tangent - [Video 372](#)

The diagram shows the circle $x^2 + y^2 = 29$ with a tangent at the point $(-5, 2)$



263. Find the gradient of the line AO .

.....

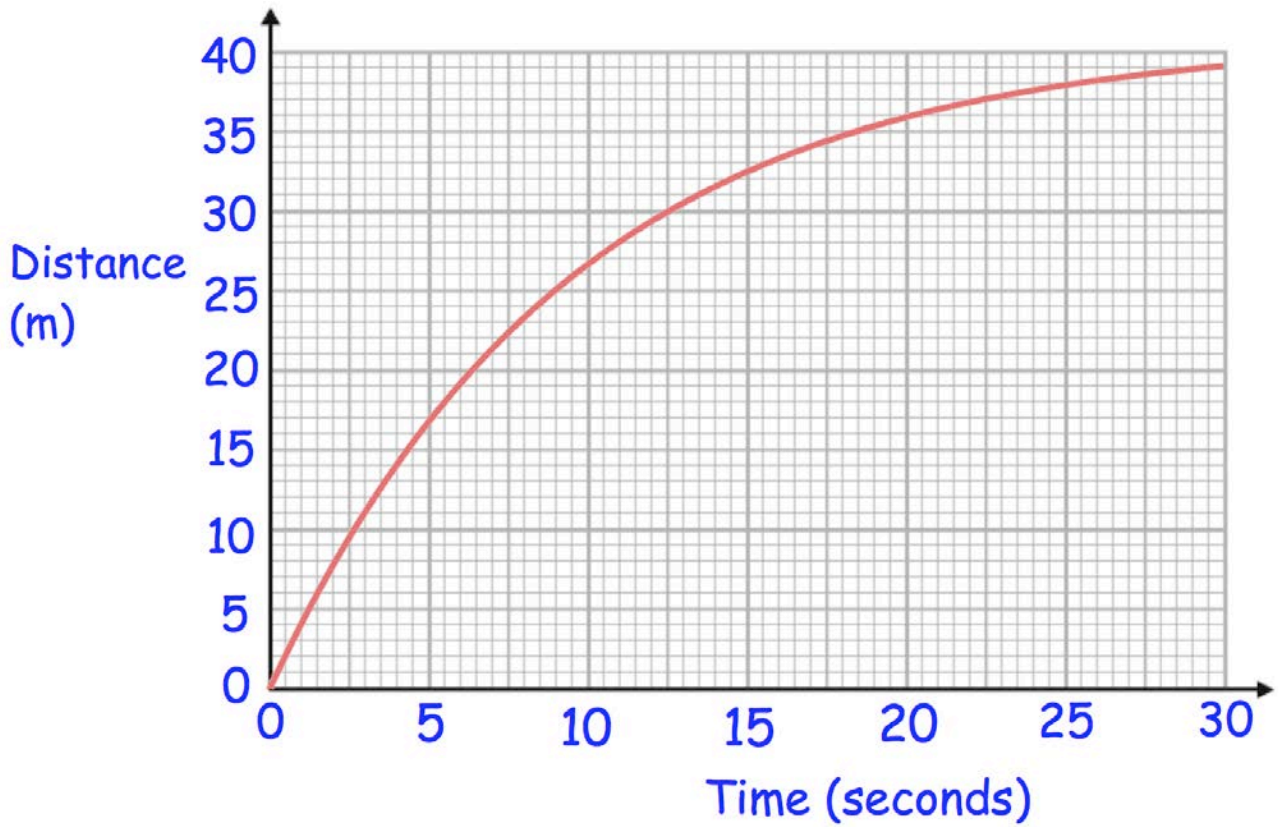
264. Find the gradient of the tangent

.....

265. Find the equation of the tangent

.....

Rates of Change - [Video 390a](#)



266. Work out the speed of the car when $t = 5$

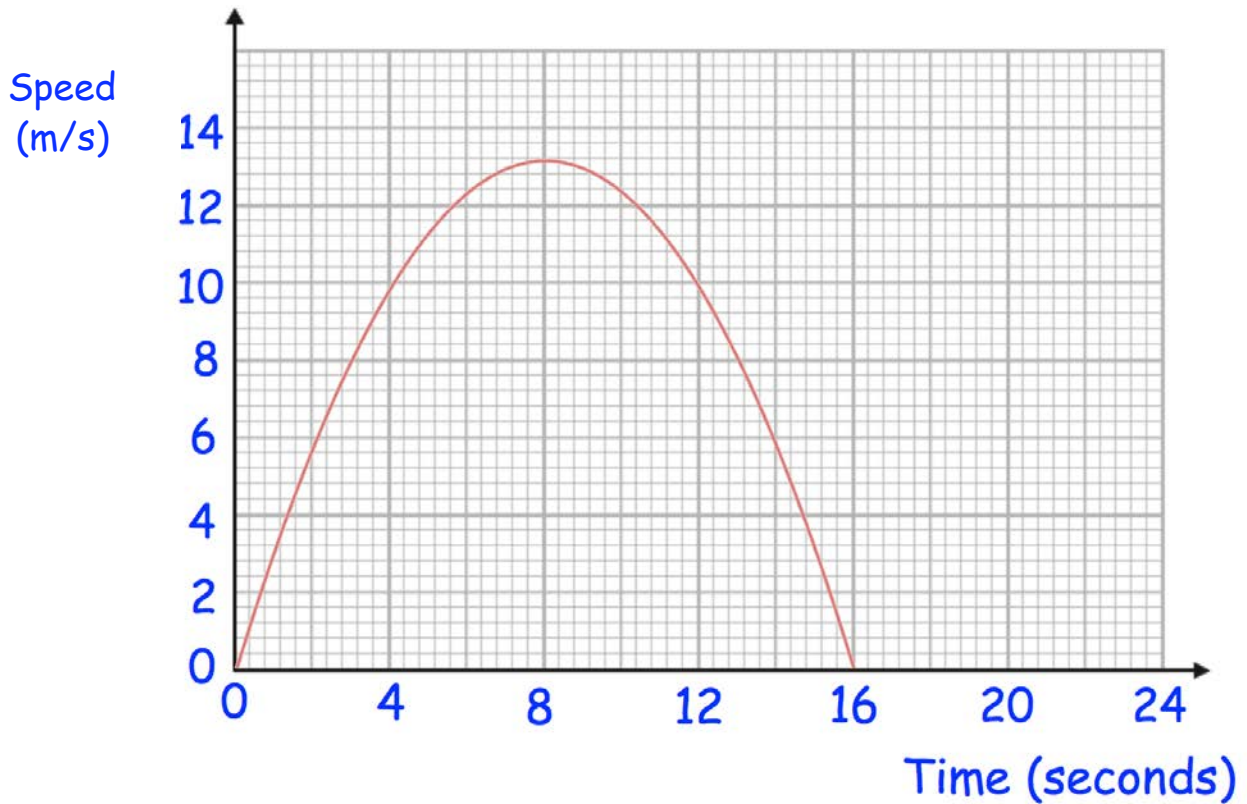
.....m/s

267. Work out the average speed of the car between $t = 15$ and $t = 25$

.....m/s

Area under a Graph - Video 389

Here is a speed-time graph for a toy rocket.



268. Work out an estimate for the distance the rocket travelled in the 16 seconds. Use 4 strips of equal width.

.....m

269. Is your answer an underestimate or an overestimate of the actual distance the rocket travelled? Give a reason for your answer

.....
.....

Composite Functions - [Video](#)

$$f(x) = x^2 - 3$$

$$g(x) = 5x + 1$$

270. Find $fg(x)$

.....

271. Find $gf(x)$

.....

272. Find $gg(x)$

.....

273. Find $ff(x)$

.....

Inverse Functions - Video

Given $f(x) = \frac{3x + 4}{7}$

274. find $f^{-1}(x)$

.....

275. find $f^{-1}(10)$

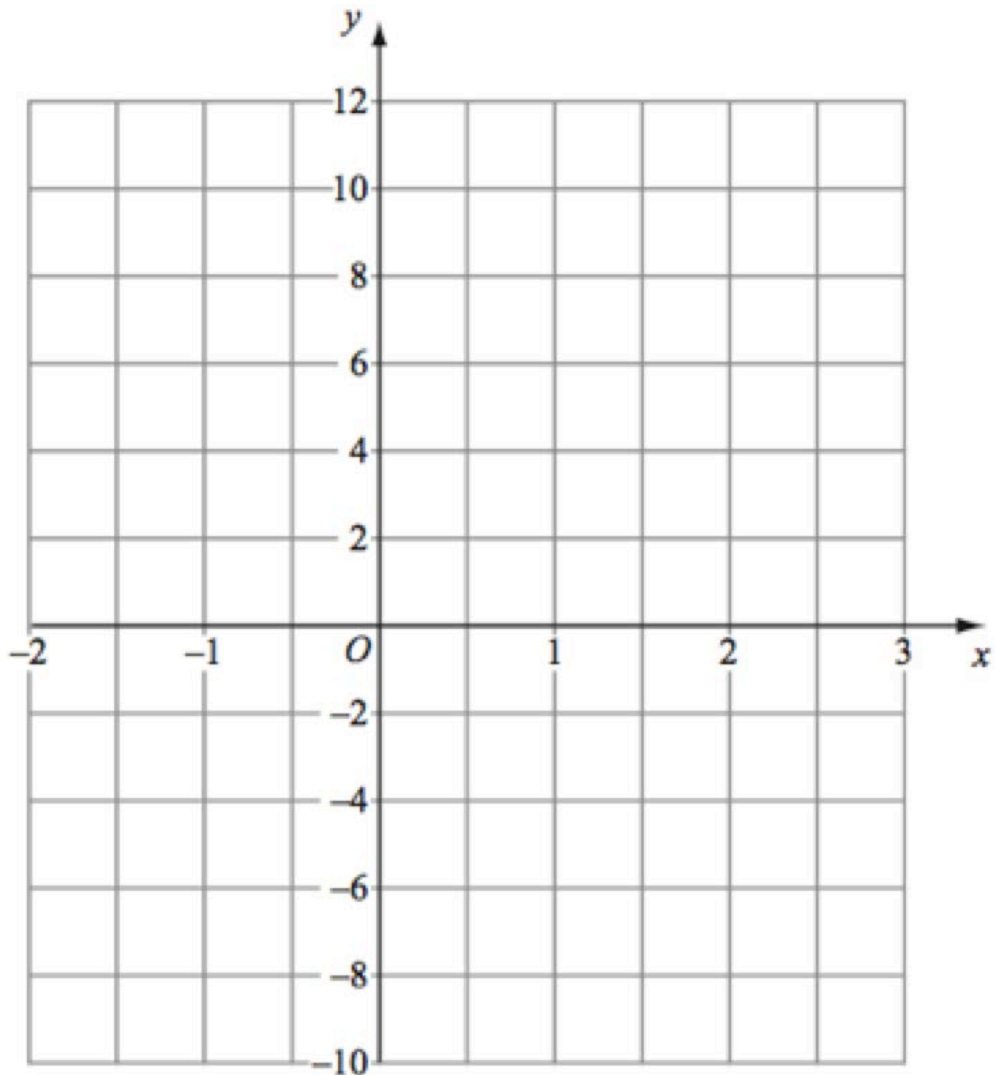
.....

Quadratic Graphs - [Video 264](#)

276. Complete the table of values for $y = x^2 - 2x$

x	-2	-1	0	1	2	3
y		3			0	

277. Draw the graph of $y = x^2 - 2x$



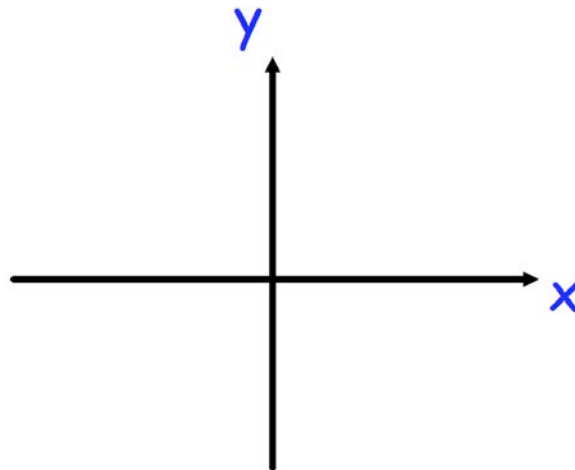
Solving Quadratics Graphically - [Video 267c](#)

278. Use the graph from the previous question to estimate the values of x when $y = 2$

$x = \dots\dots\dots$ and $x = \dots\dots\dots$

Sketching Quadratics - [Video 265](#)

279. Sketch the graph of $y = x^2 - x - 12$ below.
Clearly show where the graph meets the x -axis and y -axis.



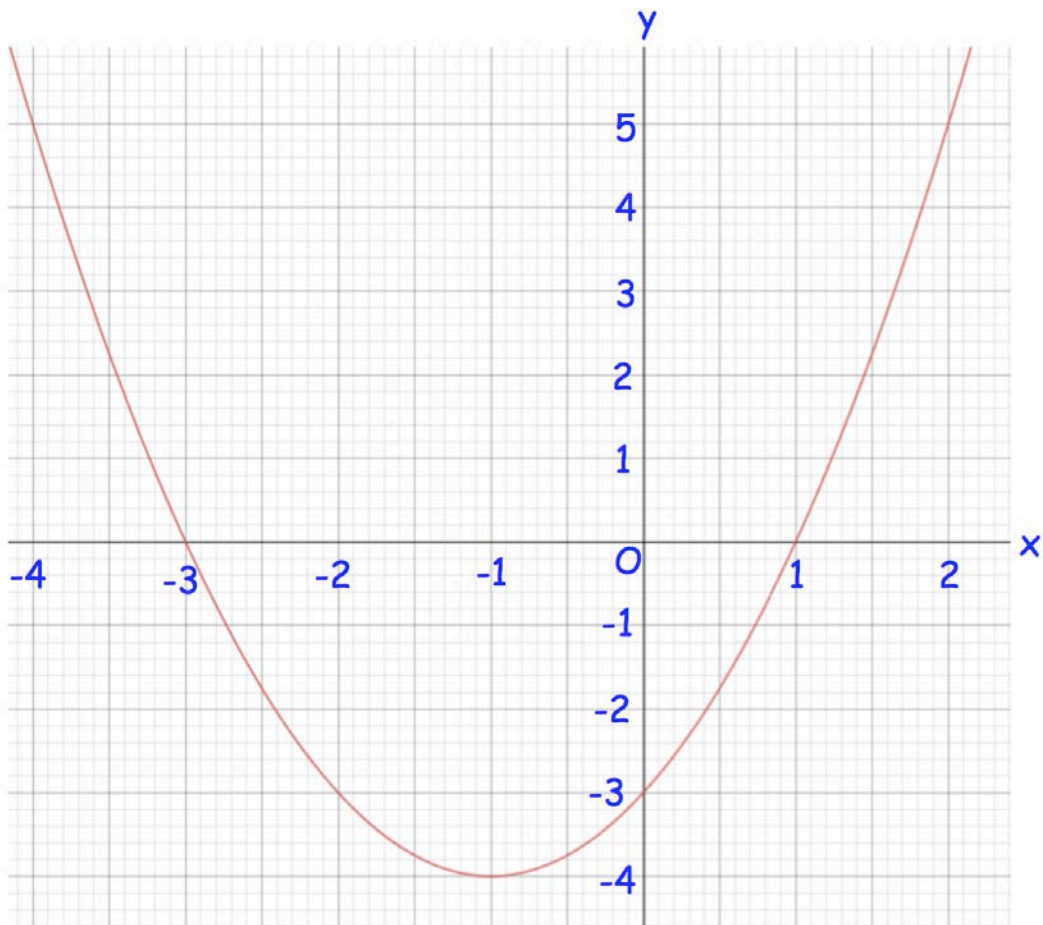
Intersection Points - [Video 267c](#), [267d](#)

280. Write down the coordinates of where $y = x^2 - 3x$ and $y = x$ intersect.

.....

Quadratics - Graphical Solutions - [Video 267d](#)

281. Shown below is the graph of $y = x^2 + 2x - 3$



By drawing an appropriate straight line, use your graph to find estimates for solutions of $x^2 + 3x - 2 = 0$

.....

Quadratic Graphs - Turning Points and Symmetry - Video

282. Find the coordinates of the turning point of the graph $y = x^2 + 8x - 17$

.....

283. Find the equation of the line of symmetry of $y = x^2 + 8x - 17$

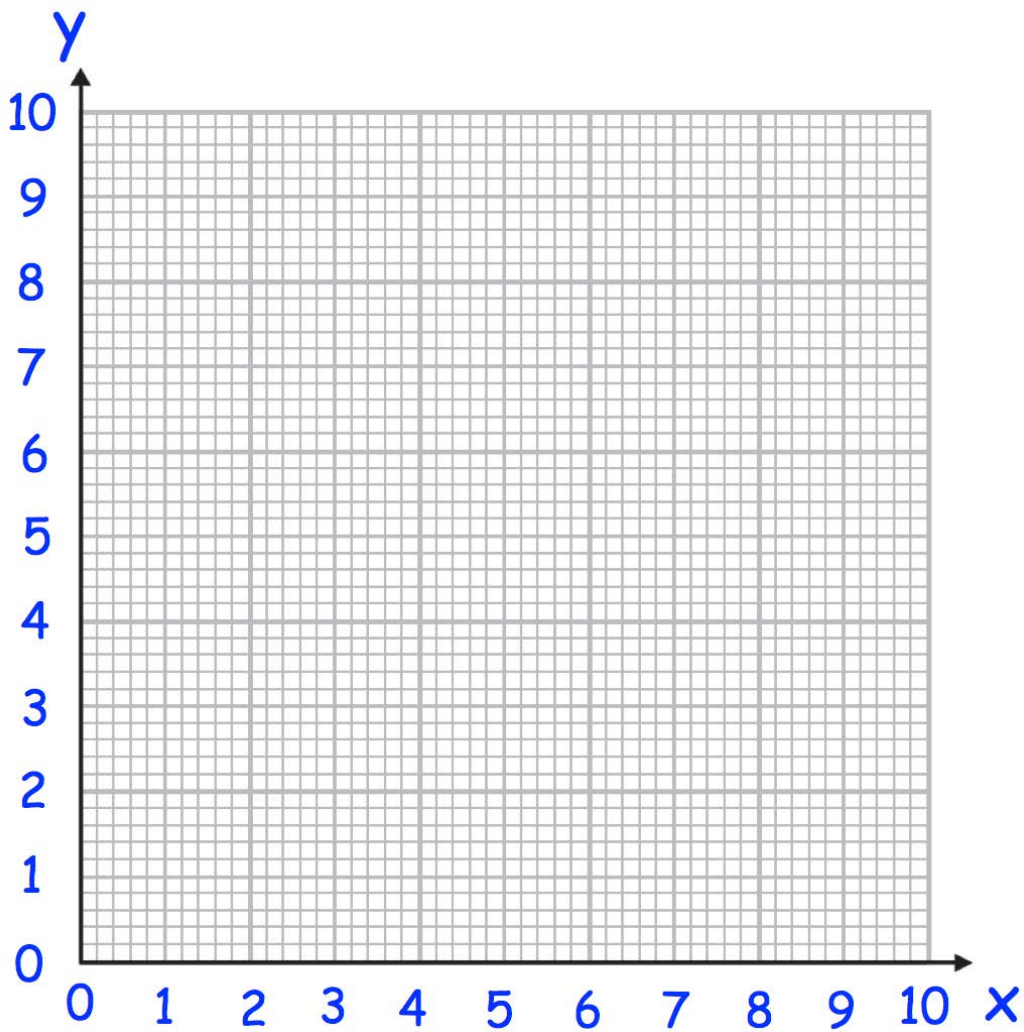
.....

Reciprocal Graphs - Video 346

284. Complete the table of values for $y = \frac{5}{x}$

x	0.5	1	2	4	8	10
y						

285. On the grid, draw the graph of $y = \frac{5}{x}$ for $0.5 \leq x \leq 10$

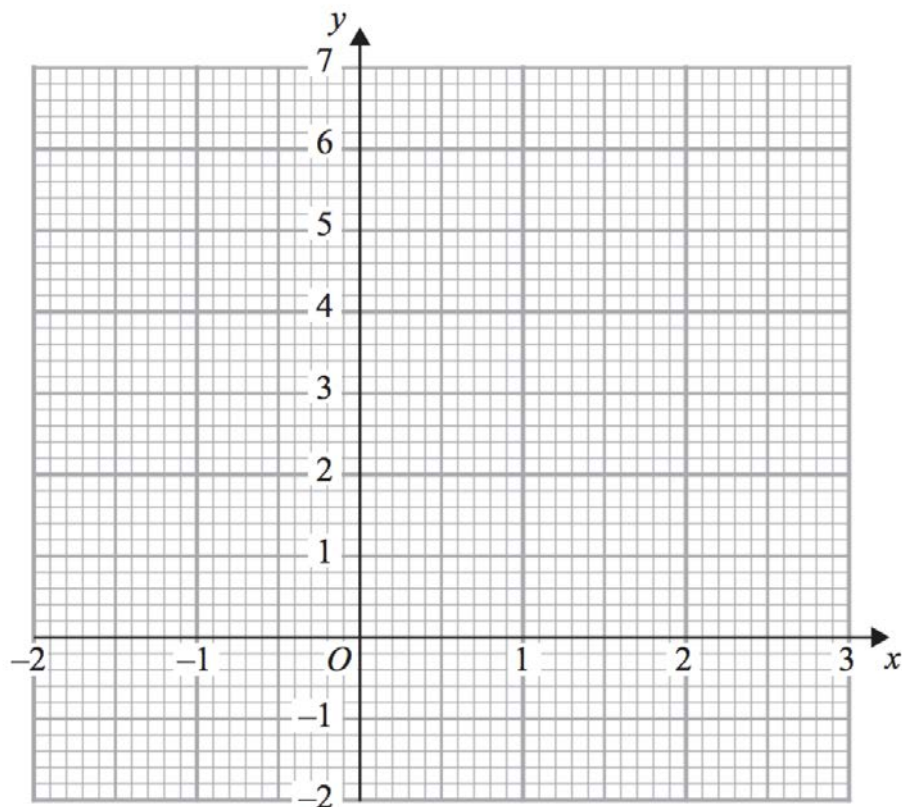


Cubic Graphs - Video 344

286. Complete the table of values for $y = x^3 - 2x + 3$

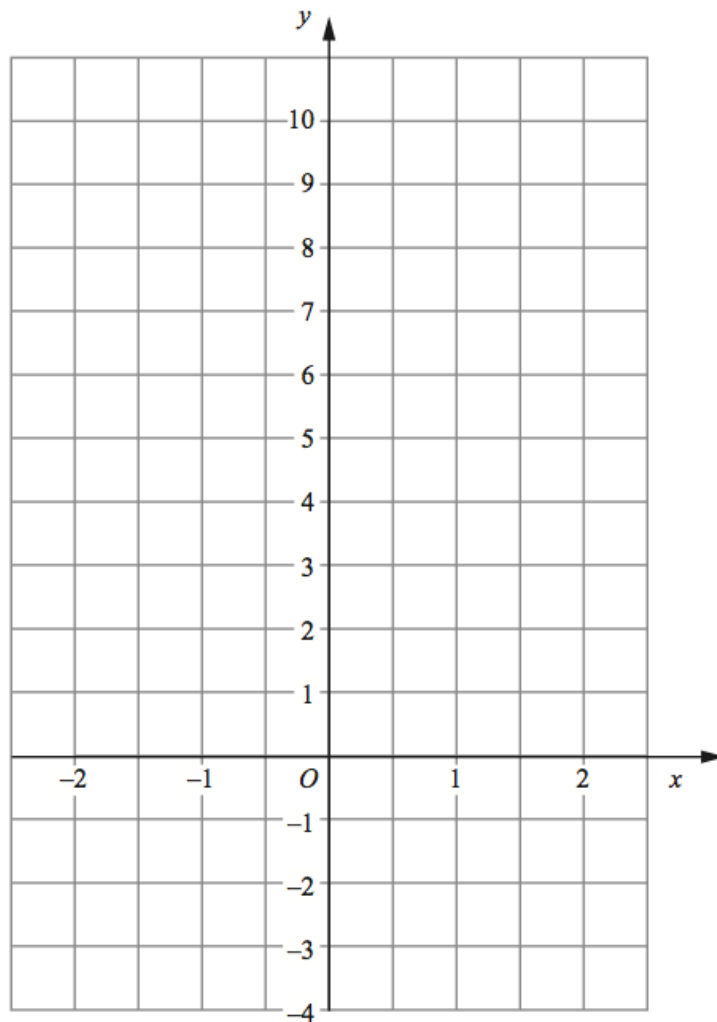
x	-2	-1	0	1	2
y					

287. On the grid, draw the graph of $y = x^3 - 2x + 3$ for $-2 \leq x \leq 2$



Exponential Graphs - [Video 345](#)

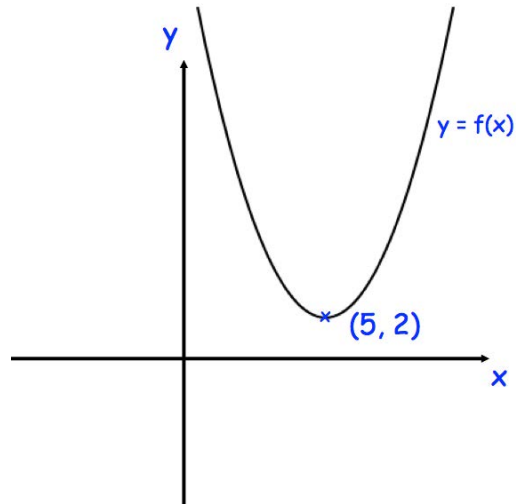
288. Draw $y = 3^x$ for values from -2 to 2



Transforming Graphs - [Video 345](#)

Shown below is the graph of $y = f(x)$

The coordinates of the minimum point are $(5, 2)$.



Write down the coordinates of the minimum point of the curve with equation.

289. $y = f(x) - 1$

.....

290. $y = f(-x)$

.....

291. $y = f(x + 1)$

.....

292. $y = -f(x)$

.....

Iteration - Video

293. Use the iteration formula $x_{n+1} = \sqrt[3]{5 - \frac{1}{x_n}}$ three times with $x_0 = 1.5$ to

find an estimate for the solution of $x^4 - 5x + 1 = 0$

.....

294. $T_{n+1} = 1.2T_n + 800$

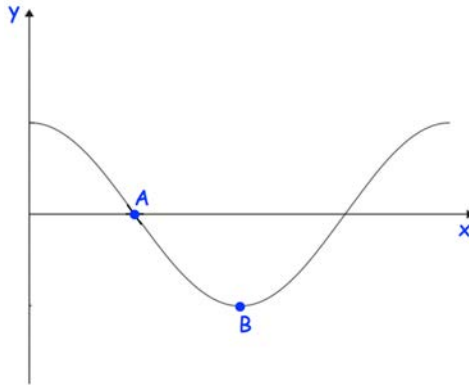
In their first season, an ice hockey team sold 1000 season tickets.

Work out how many season tickets were sold in their fourth season.

.....

Trig Graphs - [Video](#)

Here is a sketch of $y = \cos(x)$ for $0^\circ \leq x \leq 360^\circ$



295. Write down the coordinates of the point A.

.....

296. Write down the coordinates of the point B.

.....

Solving Inequalities - [Video 178](#)

297. Solve $4x < 32$

.....

298. Solve $5x + 1 > 91$

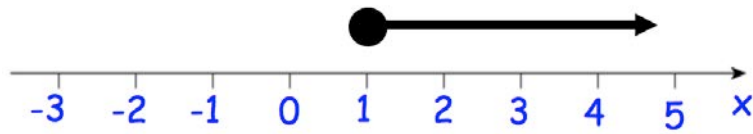
.....

299. Solve $7x - 5 \leq 3x + 11$

.....

Inequalities (number line) - [Video 177](#)

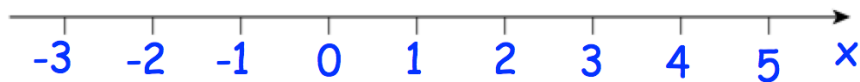
300.



Write down the inequality shown above.

.....

301. Solve the inequality $2x - 1 < 5$ and represent the answer on the number line below.



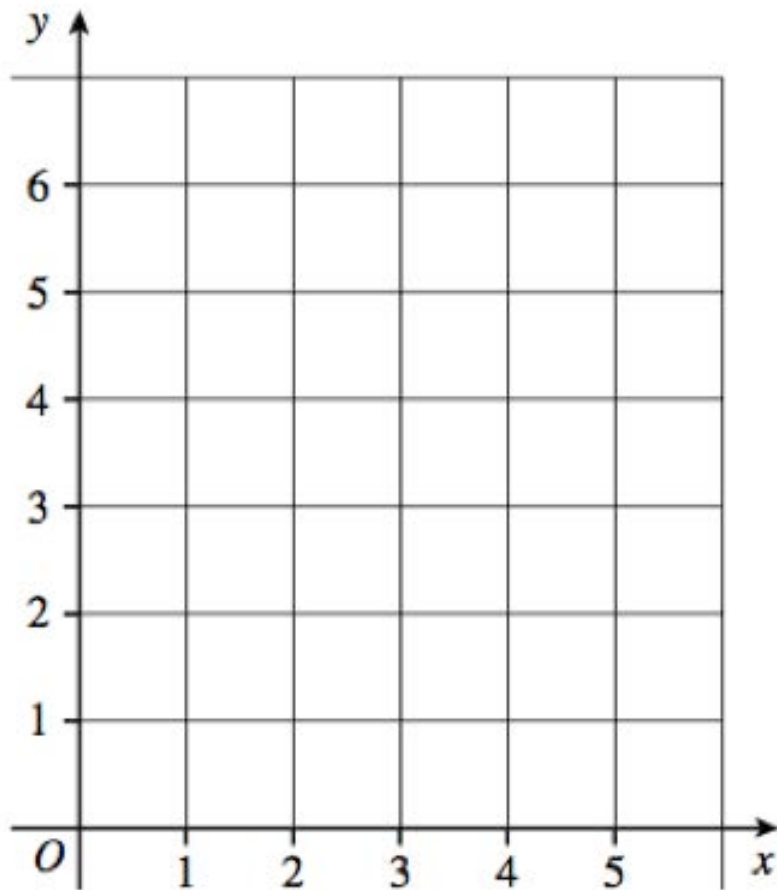
302. List all the integers that satisfy the inequality $4 < 3n < 15$

.....

Graphical Inequalities - Video 182

303. On the grid, clearly indicate the region that satisfies all these inequalities.

$$x \geq 3 \quad y \geq 1 \quad x + y \leq 5$$



Quadratic Inequalities - [Video x](#)

304. Solve the inequality $x^2 - x - 30 < 0$

.....

305. Solve the inequality $x^2 - 8x + 12 \geq 0$

.....

306. Solve the inequality $7x^2 + 8x + 1 > 0$

.....

Triangular Numbers - [Video 229](#)

307. List the first 6 triangular numbers

.....

Fibonacci - [Video 287a](#)

308. Here are the first five terms of a Fibonacci sequence.

2 5 7 12 19

Write down the next two terms of the sequence.

..... and

nth Term - [Video 288](#)

309. Find the nth term of 9, 20, 31, 42

.....

310. Find the nth term of 50, 48, 46, 44

.....

311. Find the n th term and the 100th term of 7, 10, 13, 16

n th term =

100th term =

Arithmetic Progressions - [Video 375](#)

312. The first two terms of an arithmetic progression are $3y$ and $7y$.

Find the fifth term of the progression.

.....

Geometric Progressions - [Video 375](#)

313. Circle the geometric progression.

11, 9, 7, 5 ...

1, 4, 9, 16 ...

11, 21, 31, 41 ...

1, 4, 16, 64 ...

314. The third term of a geometric sequence is 48
The fourth term of a geometric sequence is 24

Work out the difference between the first and fifth terms.

.....

Quadratic nth Term - [Video 388](#)

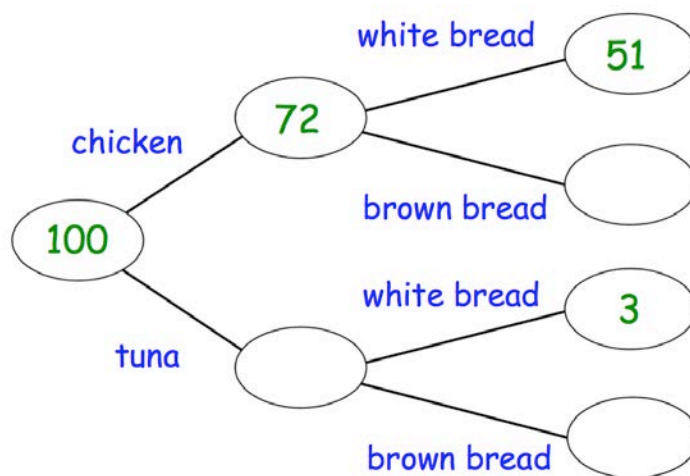
315. Find the nth term of 7, 11, 17, 25 ...

Algebraic Proof - [Video 365](#)

316. Prove $(n + 2)^2 - (n - 2)^2 + 3$ is always odd for all positive integer values of n.

Frequency Trees - [Video 376](#)

317. Complete the frequency tree.

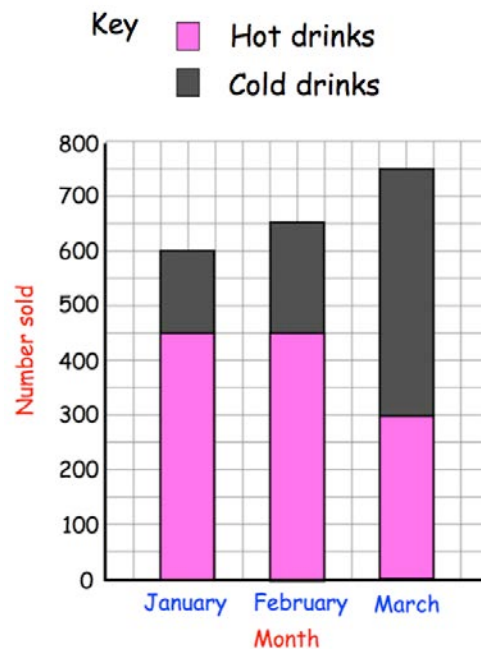


Two-way Tables - [Video 319](#)

318. Complete the two-way table.

	T-shirts	Jumpers	Coats	Total
Small	2	36	28	
Medium		0	1	10
Large		51		
Total			44	200

Composite Bar Charts - Video [148b](#)



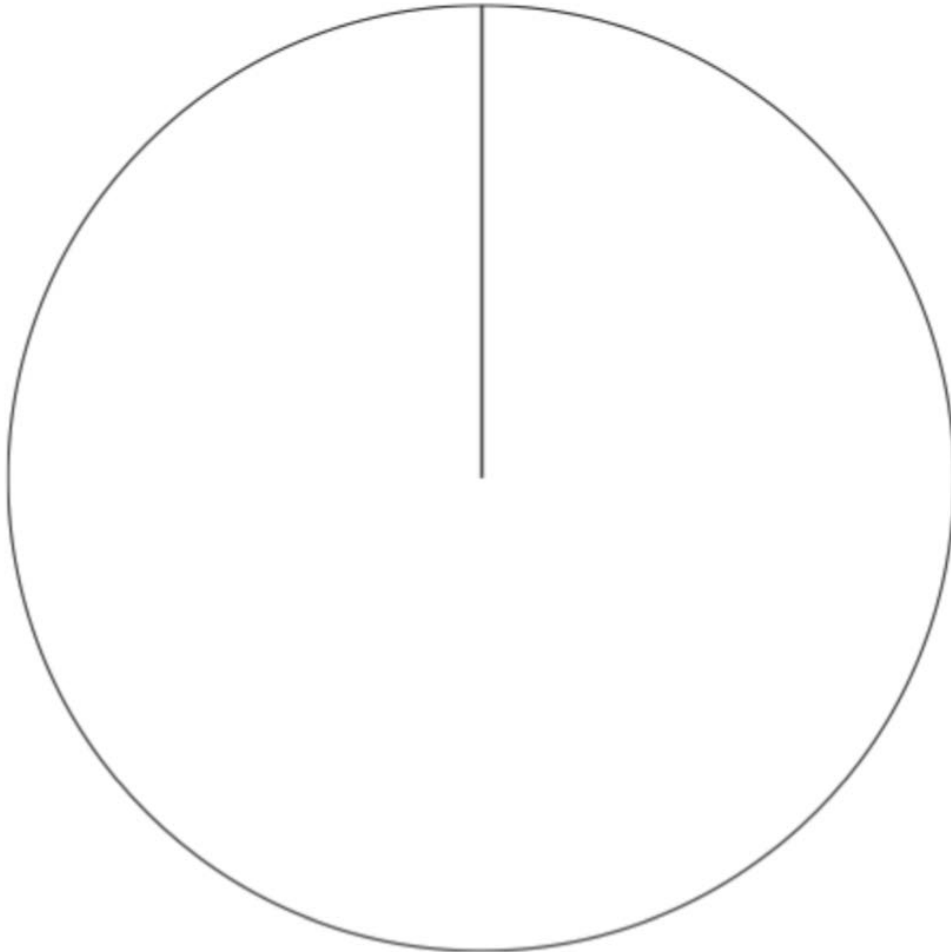
319. How many cold drinks were sold in total over 3 months?

Pie Charts - [Videos 163, 164](#)

320. Sixty beads are placed in a box.

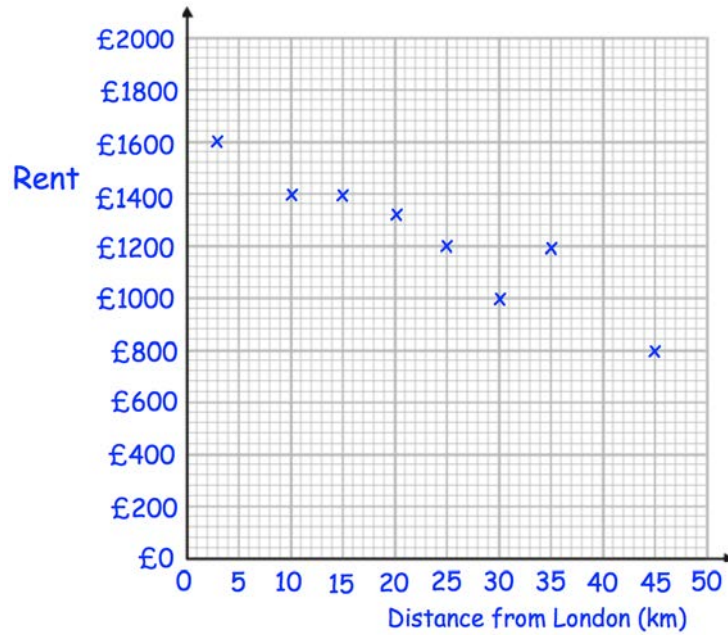
Draw a pie chart to represent the colours of the beads in the box.

Colour	Frequency
Blue	25
Green	14
Red	21



Scatter Graphs - [Videos 165 to 168](#)

The scatter graph shows information about the cost of renting apartments and their distance from London.



321. What type of correlation is shown?

.....

322. Estimate the cost of renting an apartment 40km from London.

£.....

323. Explain why it may not be sensible to use the scatter graph to estimate the cost of renting an apartment that is 75km from London.

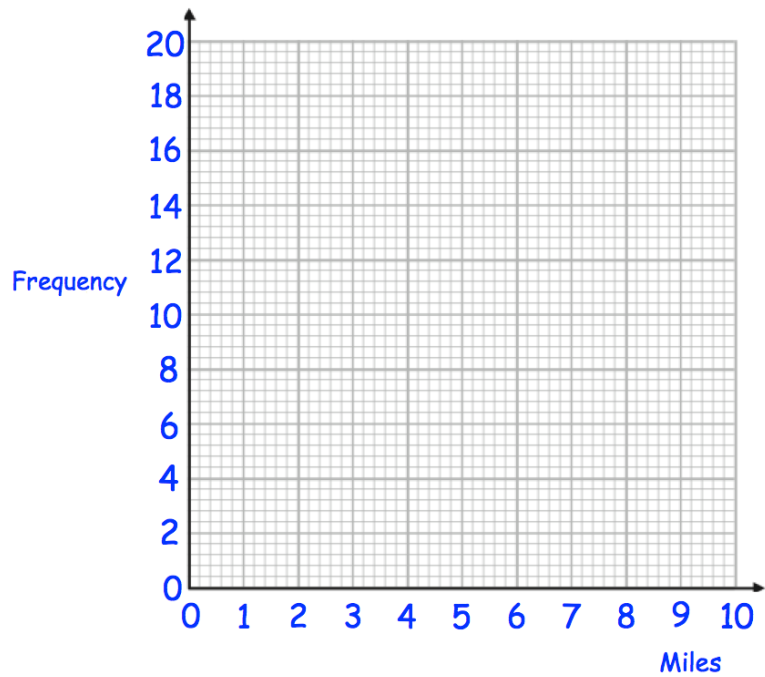
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.....

Frequency Polygons - [Videos 155, 156](#)

324. Draw a frequency polygon to represent the data in the table.

Distance (miles)	Frequency
$0 < d \leq 2$	20
$2 < d \leq 4$	10
$4 < d \leq 6$	11
$6 < d \leq 8$	4
$8 < d \leq 10$	3



Mode from a Frequency Table - [Video 56a](#)

325. The table shows the number of apples eaten one day by 40 people.

Number of apples	Frequency
0	11
1	14
2	8
3	7

Write down the modal number of apples eaten.

.....

Mean from a Frequency Table - [Video 54](#)

326. The table shows the number of apples eaten one day by 10 people.

Number of apples	Frequency
0	2
1	2
2	5
3	1

Work out the mean number of apples eaten.

.....

Median from a Frequency Table - [Video 51](#)

327. The table shows the number of apples eaten one day by 9 people.

Number of apples	Frequency
0	3
1	4
2	1
3	1

Work out the median number of apples eaten.

.....

Combined Mean - [Video 53a](#)

328. There are 40 houses in *Greenvale* and 60 houses in *Redville*.

The mean number of cars per house in *Greenvale* is 1.5

The mean number of cars per house in *Redville* is 3

Work out the mean number of cars per house in both villages.

.....

Estimated Mean - [Video 55](#)

329. Work out an estimate for the mean length.

Length (cm)	Frequency
$0 \leq L < 30$	8
$30 \leq L < 60$	43
$60 \leq L < 90$	25
$90 \leq L < 120$	4

.....

Modal Class - [Video 56a](#)

330. Write down the modal class interval.

Length (cm)	Frequency
$0 \leq L < 30$	8
$30 \leq L < 60$	43
$60 \leq L < 90$	25
$90 \leq L < 120$	4

.....

Class containing Median - [Video 52a](#)

331. Which class interval contains the median?

Length (cm)	Frequency
$0 \leq L < 30$	8
$30 \leq L < 60$	43
$60 \leq L < 90$	25
$90 \leq L < 120$	4

.....

Median from Grouped Data - [Video 52](#)

332. Work out an estimate of the median length.

Length (cm)	Frequency
$0 \leq L < 30$	8
$30 \leq L < 60$	43
$60 \leq L < 90$	25
$90 \leq L < 120$	4

Stem-and-Leaf - [Videos 169, 170](#)

333. The stem and leaf diagram shows the heights of 14 friends visiting a theme park

Key: 13|5 means 135cm

13		5	7	8			
14		1	1	2	6	7	9
15		0	2	7			
16		1	8				

What fraction of the friends have a height greater than 1.4m?

Quartiles - [Video 57b](#)

Here are the ages of 11 people.

20 24 29 30 36 37 41 42 50 55 56

334. Find the lower quartile

.....

335. Find the upper quartile

.....

336. Find the interquartile range

.....

Cumulative Frequency - [Videos 153, 154](#)

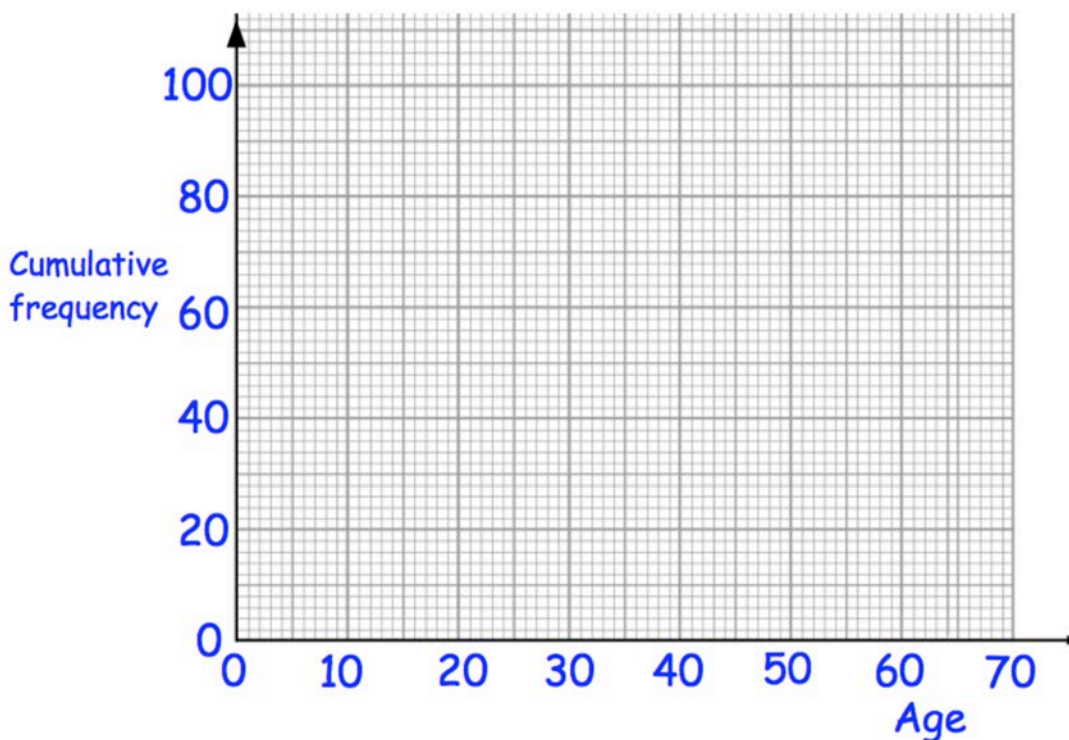
The table below shows the ages of 100 employees.

Age, x years	Frequency
$20 < x \leq 30$	12
$30 < x \leq 40$	30
$40 < x \leq 50$	28
$50 < x \leq 60$	22
$60 < x \leq 70$	8

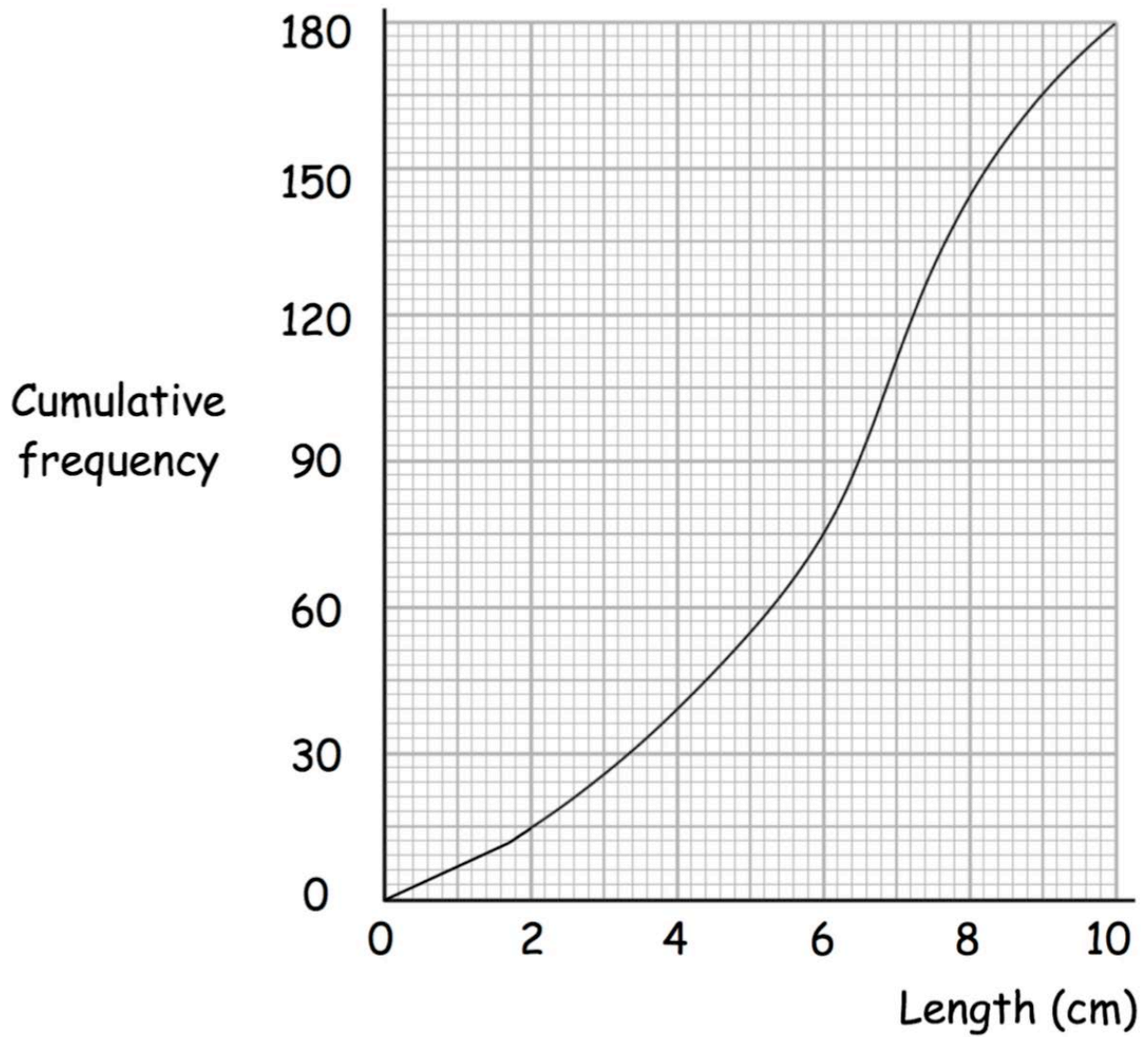
337. Complete the cumulative frequency table.

Age, x years	Cumulative Frequency
$20 < x \leq 30$	
$20 < x \leq 40$	
$20 < x \leq 50$	
$20 < x \leq 60$	
$20 < x \leq 70$	

338. Draw a cumulative frequency curve.



180 students were asked to draw a 6cm line.
 The cumulative frequency curve shows the actual lengths of their lines.



339. Find an estimate of the median

.....cm

340. Find an estimate of the lower quartile

.....cm

341. Find the interquartile range

.....cm

342. Estimate how many people drew a line shorter than 2cm

.....

343. Estimate how many people drew a line longer than 9cm

.....

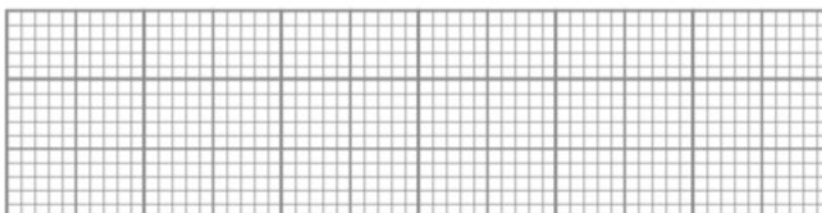
344. 20% of people drew a line shorter than x cm
Find an estimate for x.

.....cm

Box Plots - [Videos 149, 150](#)

345. Draw a box plot to show this information

Lowest Value	7
Median	35
Upper Quartile	41
Range	45
Interquartile Range	11

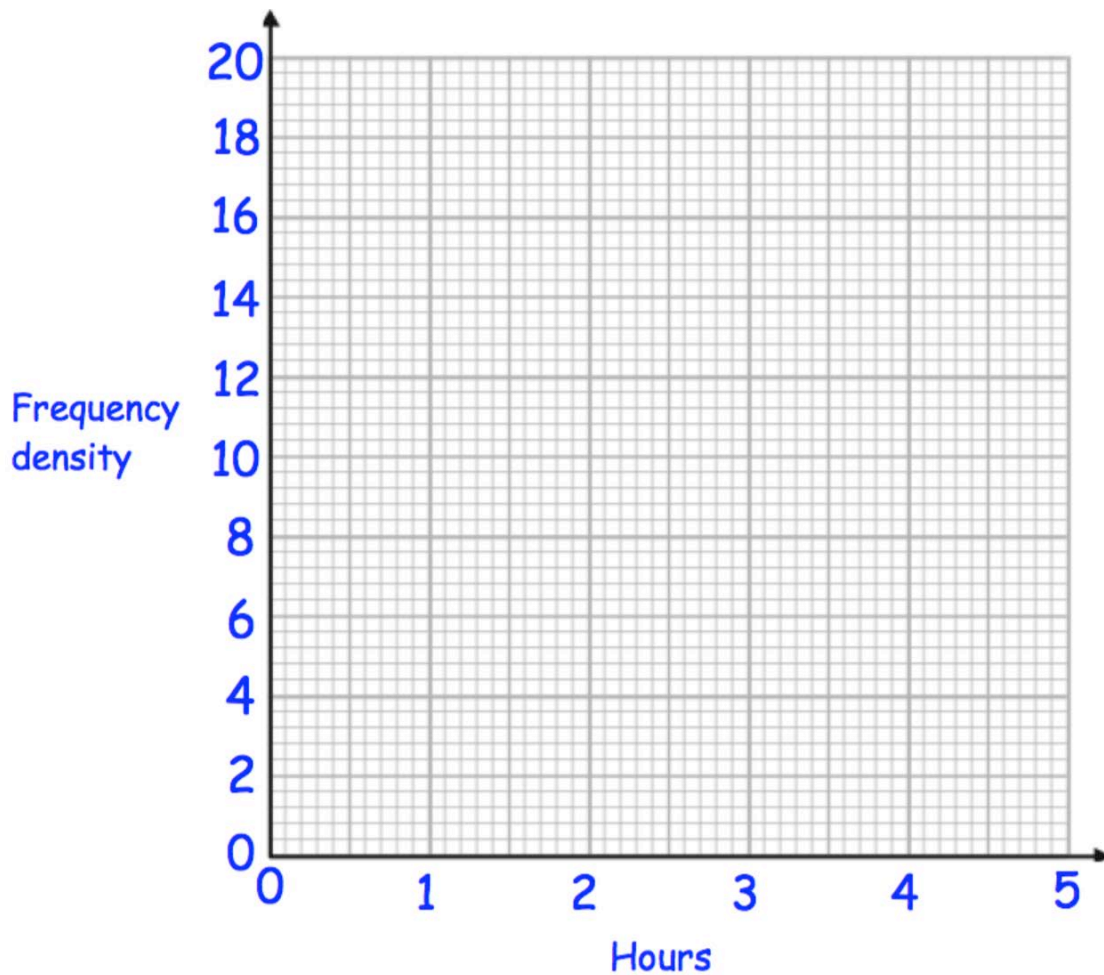


Histograms - Videos 157 to 159, 52

The table below shows the waiting times of 40 patients in a hospital.

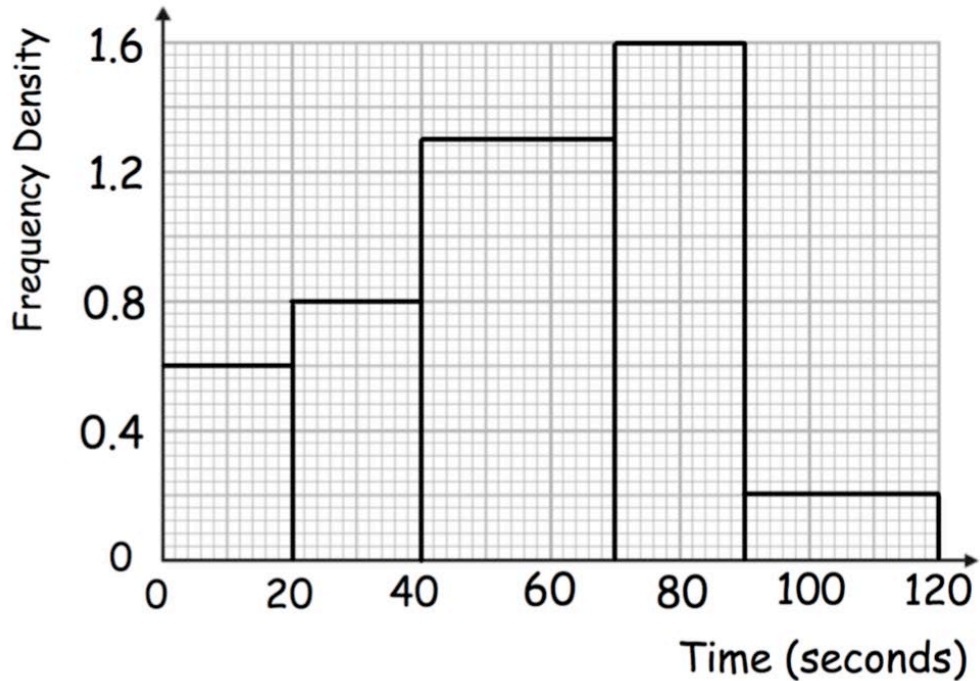
Waiting time, h	Frequency
$0 < h \leq 0.5$	8
$0.5 < h \leq 1$	10
$1 < h \leq 1.5$	7
$1.5 < h \leq 3$	9
$3 < h \leq 5$	6

346. Draw a histogram to represent this information.



The histogram shows information about the time taken to answer a question by a group of students.

12 students answered the question in less than 20 seconds.



347. How many students took between 70 and 90 seconds?

.....

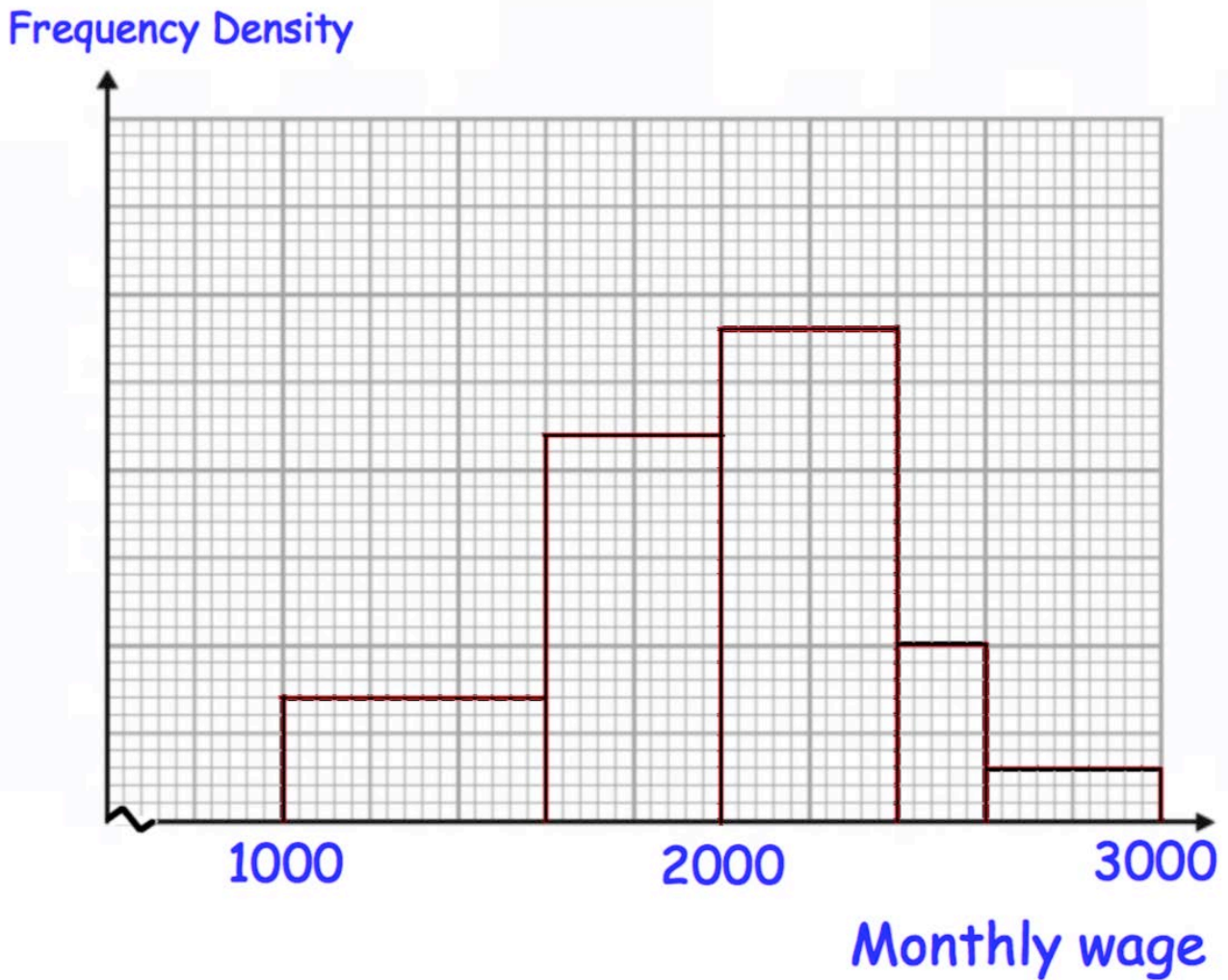
348. Estimate how many students took longer than 100 seconds.

.....

349. What fraction of the students took longer than 40 seconds to answer?

.....

The histogram below shows the monthly salaries of employees.
 There are 216 people who have a monthly salary of between £1800 and £2100.



350. Work out an estimate of how many employees have a salary of between £2300 and £2900

Probability - [Video 245](#)

351. There are white, orange, purple and pink beads in a box.

The table shows the probability of selecting a white and an orange bead.
The probability of a purple : probability of a pink = 2 : 5

Complete the table.

Colour	White	Orange	Purple	Pink
Probability	0.29	0.15		

Not Happening - [Video 250](#)

352. On a day in December, the probability of it snowing is 0.315

What is the probability of it **not** snowing?

.....

Expectation - [Video 248a](#)

353. The probability that a machine makes a faulty lightbulb is 0.008

Last week the machine made 4500 lightbulbs.

Work out how many lightbulbs should be faulty.

.....

Relative Frequency - [Video 248](#)

David and Becky want to estimate how many yellow jelly beans are in a tub.

A trial consists of taking a jelly bean at random, noting the colour, and replacing the jelly bean in the tub.

	Number of trials	Number of yellow jelly beans chosen
David	20	3
Becky	100	11

354. Write down the relative frequency of David taking a yellow jelly bean.

.....

355. Write down the relative frequency of Becky taking a yellow jelly bean.

.....

356. Whose experiment gives the more reliable results?
Give a reason for your answer.

.....

.....

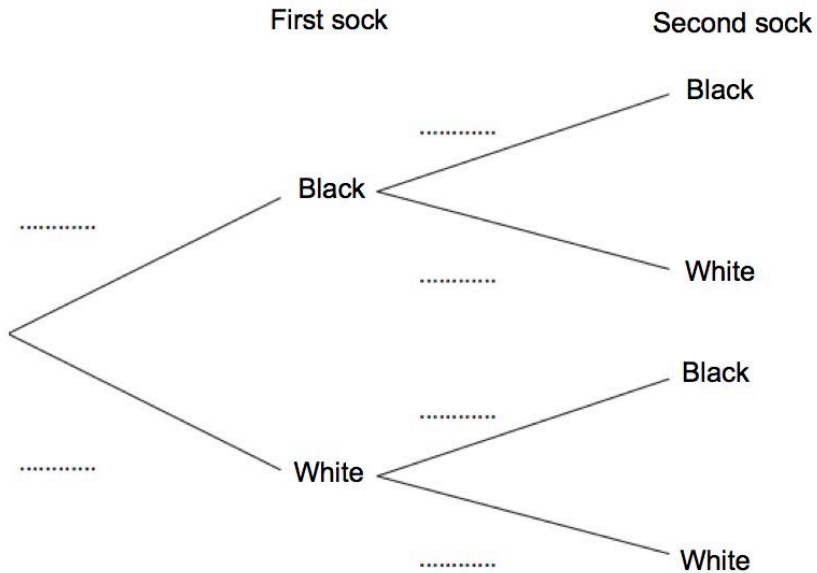
Tree Diagrams - [Video 252](#)

Siobhan has 10 socks in a drawer.

6 socks are black and 4 socks are white.

She picks a sock at random, puts it back and then takes out a second at random.

357. Complete the tree diagram.



358. Work out the probability that the two socks are both white.

.....

359. Work out the probability that the two socks are the same colour.

.....

360. Work out the probability that the two socks are different colours.

.....

Independent Events - [Video 249](#)

361. Jackson and Kelvin each sit a test.

The probability that Jackson passes is 0.8

The probability that Kelvin passes is 0.6

Find the probability that both of them pass.

.....

Conditional Probability - [Video 247](#)

Dexter has 7 red and 5 green socks in a bag.

He takes out two socks at random from the bag, without replacement.

362. Find the probability that the two socks are the same colour.

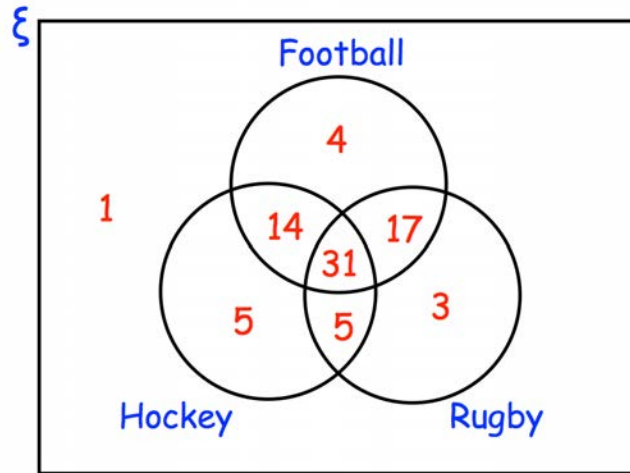
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363. Find the probability that the two socks are different colours.

.....

Venn Diagrams - [Video 380](#)

Jennifer asked 80 people which sports they enjoy from football, hockey and rugby.



364. How many people enjoy all three sports?

.....

365. How many people enjoy football and rugby but not hockey?

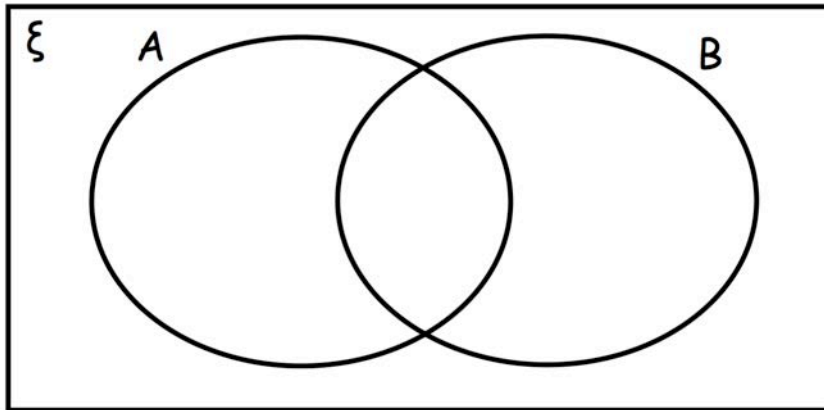
.....

366. $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

$A = \{1, 5, 7, 9\}$

$B = \{3, 7, 9\}$

Complete the Venn diagram



A number is chosen at random, find the probability of:

367. $P(A')$

.....

368. $P(A \cup B)$

.....

369. $P(A \cap B)$

.....

Samples - [Video 281a](#)

Mrs Martin wants to open a new restaurant in her town.
She wants to find out what type of food people in her town like.

370. Caolán suggests that she posts a survey to 100 people chosen at random across the country.

Explain why this is not sensible.

.....

.....

371. Jack suggests that she surveys 5 people in the town centre.

Explain how Jack's suggestion could be improved.

.....

.....

Capture Recapture - [Video 391](#)

Kathryn wants to estimate how many fish live in a pond.

On Monday, she captures and tags 60 fish.
She then releases them back into the pond.

On Wednesday, Kathryn captures 40 fish.
6 of the fish are tagged.

372. Estimate how many fish live in the pond.

.....