

## S4 Revision

### Non-calculator:

1. Find the value of

- |                                   |                                  |                             |
|-----------------------------------|----------------------------------|-----------------------------|
| (a) $6.14 + 32 + 0.99$            | (b) $2.7 - 1.66$                 | (c) $14.8 - 9.345$          |
| (d) $21.6 \times 30$              | (e) $0.034 \times 200$           | (f) $21.6 \div 200$         |
| (g) $242 \div 400$                | (h) 30% of £3400                 | (i) 45% of £220             |
| (j) $33\frac{1}{3}\%$ of 45000 kg | (k) $\frac{3}{8}$ of £720        | (l) $\frac{2}{3}$ of 342 cm |
| (m) $\frac{3}{4} + \frac{2}{3}$   | (n) $1\frac{1}{4} - \frac{3}{5}$ | (o) $6 \times 1\frac{5}{7}$ |

2. A school has a roll of 945 pupils.  $\frac{4}{9}$  of the pupils are boys. How many girls are in the school?

3. Find the value of

- |               |                     |                   |                      |
|---------------|---------------------|-------------------|----------------------|
| (a) $-8 + 3$  | (b) $-2 - 7$        | (c) $-6 + 10 - 6$ | (d) $2 - 11 + 7 - 4$ |
| (e) $3p - 8p$ | (f) $-5g + 3g - 6g$ |                   |                      |

4. Expand the brackets and simplify

- |                         |                       |                             |
|-------------------------|-----------------------|-----------------------------|
| (a) $5g + 3h - 2g - 7h$ | (b) $2m - 4 + 3m - 2$ | (c) $2(3a + 4) - 5a$        |
| (d) $7(m + 2n) - 16n$   | (e) $5 + 3(2x - 4)$   | (f) $4(x + 3y) + 2(x - 5y)$ |

5. Solve

- |                     |                        |                       |
|---------------------|------------------------|-----------------------|
| (a) $3x - 4 = 11$   | (b) $6 + 5g > 21$      | (c) $2(3n - 4) = 1$   |
| (d) $4(3 + 2d) < 4$ | (e) $5u + 3 = 2u + 18$ | (f) $6m - 5 = m - 20$ |

6. Write in Scientific Notation

- |             |                |                 |                  |
|-------------|----------------|-----------------|------------------|
| (a) 342 000 | (b) 21 million | (c) 3.7 million | (d) 0.000 000 56 |
| (e) 0.000 4 |                |                 |                  |

7. Write as ordinary numbers

- |                       |                           |                           |                        |
|-----------------------|---------------------------|---------------------------|------------------------|
| (a) $4.6 \times 10^7$ | (b) $2.14 \times 10^{10}$ | (c) $2.13 \times 10^{-6}$ | (d) $5 \times 10^{-8}$ |
|-----------------------|---------------------------|---------------------------|------------------------|

8. (a) The distance from the Earth to the Sun is approximately 150 million kilometres. Write this distance in Scientific Notation.

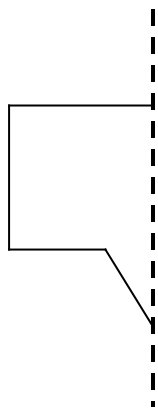
(b) The wavelength of red light is 0.000 72 cm. Write this in Scientific Notation.

(c) The distance from the planet Pluto to the Sun is approximately  $5.94 \times 10^9$  kilometres. Write this as an ordinary number.

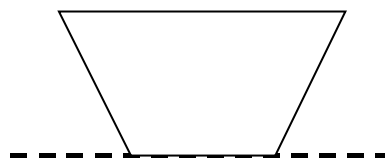
(d) A piece of gold wire is rolled to a thickness of  $6.2 \times 10^{-5}$  metres. Write this as ordinary number.

9. Copy and complete the diagrams below so that the dotted line is a line of symmetry.

(a)



(b)

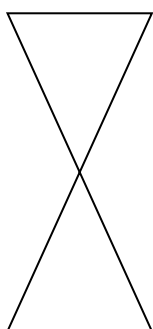


10. Which of the shapes below have half turn symmetry?

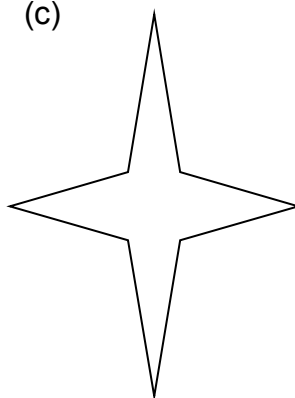
(a)



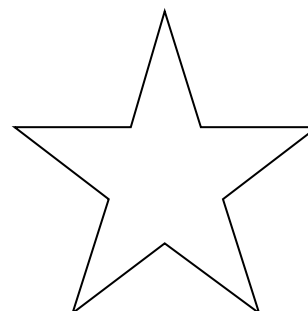
(b)



(c)



(d)



11. 1 2 3 4 5 6 8 12 16 25 28 31 35 55 70 97 100

From the list of numbers above, write down

(a) The multiples of 5

(b) The factors of 8

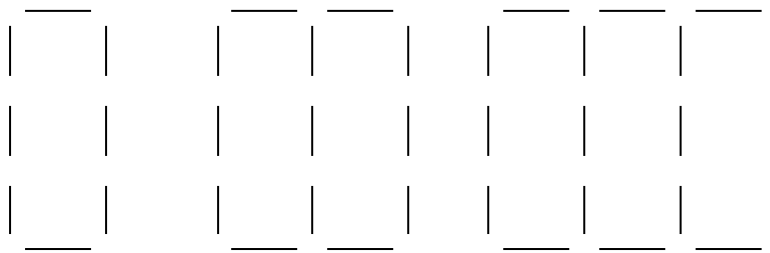
(c) The prime numbers

(d) The square numbers

12. (a) Plot the points  $A(-6,3)$ ,  $B(-2,7)$  and  $C(4,3)$ .

(b) Find a point  $D$  so that  $ABCD$  is a kite.

13. Matches are arranged as shown below.



(a) Copy and complete the table below.

Number of rectangles (R)	1	2	3	4	5	6	30
Number of Matches (M)							

(b) Write down the rule for finding the number of matches if you know the number of rectangles.

(c) How many rectangles could be made using 63 matches?

14. (a) Copy and complete the table below

P	1	2	3	4	5	6	100
Q	2	6	10				

(b) Find the rule connecting P and Q.

**Calculator section:**

15. Calculate the value of

- (a)  $7^3$       (b)  $1.4^4$       (c)  $8^3 - 2^8$       (d)  $1^2 + 2^3 + 3^4$

16. The marks of 15 pupils in a test were

23   45   49   8   21   30   43   45   25   7   45   17   12   33   45

- (a) Show this information in a stem and leaf diagram.  
 (b) Find the range of the marks  
 (c) Write down the mode.  
 (d) Find the median mark  
 (e) What is the probability a pupil scored more than 40 in the test?

17. The colours of football strip worn by 20 teams are given below.

Blue	Red	White	White	Red	Red	Yellow	Green
Red	Blue	Orange	Green	Red	Blue	Blue	Green
Green	Green	Yellow	Orange				

- (a) Show this information in a frequency table.
- (b) Draw a bar chart to illustrate the information.
- (c) What is the modal colour of strip?

18. (a) A basketball team plays 8 matches scoring the following number of points.

43 58 87 79 90 46 89 105

Calculate the mean score over these matches.



(b) The weights, in kilograms, of 6 new born puppies are

2.3 4.1 2.7 3.3 4 1.8

Calculate the average weight correct to one decimal place.



19. Given  $a = 45$ ,  $c = 22$  and  $d = 36$ , find the value of

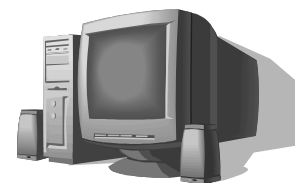
- (a)  $a^2 + d^2$       (b)  $\frac{2}{3}ac$       (c)  $3ad - \frac{1}{2}dc$       (d)  $a(5d + 3a)$       (e)  $\frac{a + dc}{c^2}$

20. A formula is given as  $u = ac - 3c^2$ . Calculate  $u$  when  $a = 7.5$  and  $c = 1.8$

21.  $P = \frac{x(x - 3y)}{y}$ . Find  $P$  when  $x = 55$  and  $y = 5$ .

22. A computer costing £780 is sold in a sale at a discount of 15%. Calculate

- (a) the discount      (b) the sale price of the computer.



23. In a survey of 2200 people, 8% were left-handed. Calculate how many right-handed people were surveyed.

24. Simplify the following ratios.

- (a) 6 : 9      (b) 24 : 16      (c) 120 : 150      (d) 2 metres : 80 centimetres



25. Blue and green paint is mixed together in the ratio 3 : 4. If 24 litres of green paint is used, how much blue paint would be needed?
26. In a maths exam the ratio of passes to fails is 7 : 4. If 35 people passed the exam, how many failed?
27. David and Amanda are going to split £120 in the ratio 2 : 3. How much will each get?
28. The results of 60 football games were recorded. The ratio of home wins to draws to away wins was 7 : 5 : 3.  
Of the 60 results, how many were home wins?

29. (i) Write as 24 hour times

- (a) 4.37 pm    (b) 2.10 am    (c) 11.35 am    (d) 10.22 pm

(ii) Write as normal am/pm times

- (a) 1356    (b) 1222    (c) 0745    (d) 1123

30. (a) A film begins at 1845 and finishes at 2133. How long does the film last?
- (b) An aeroplane leaves Glasgow at 8.32 am and travels to Capetown in South Africa where it arrives at 6.55 pm. How long did the journey take?

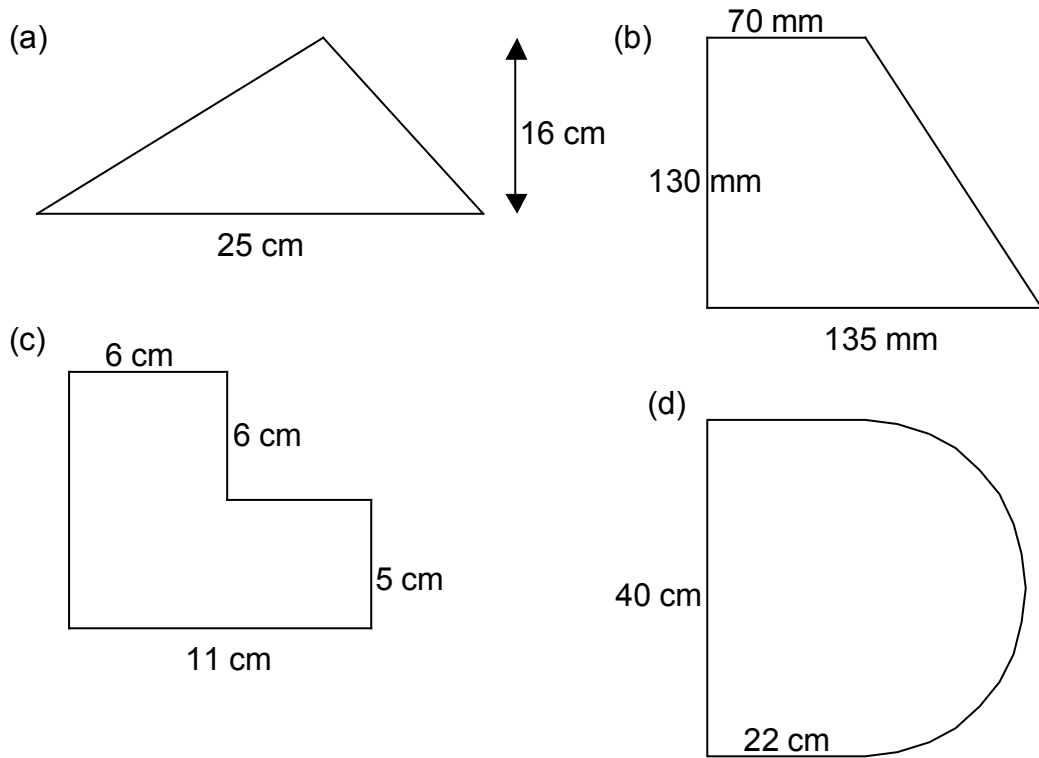
31. The timetable below shows the times of 4 buses travelling from Glasgow to London

	Bus 1	Bus 2	Bus 3	Bus 4
Glasgow	0735	1005	1355	1615
Lockerbie	0910	1135	1530	1800
Preston	1105	1322	1722	1955
Grantham	1425	1605	2005	2242
London	1608	1810	2215	0015

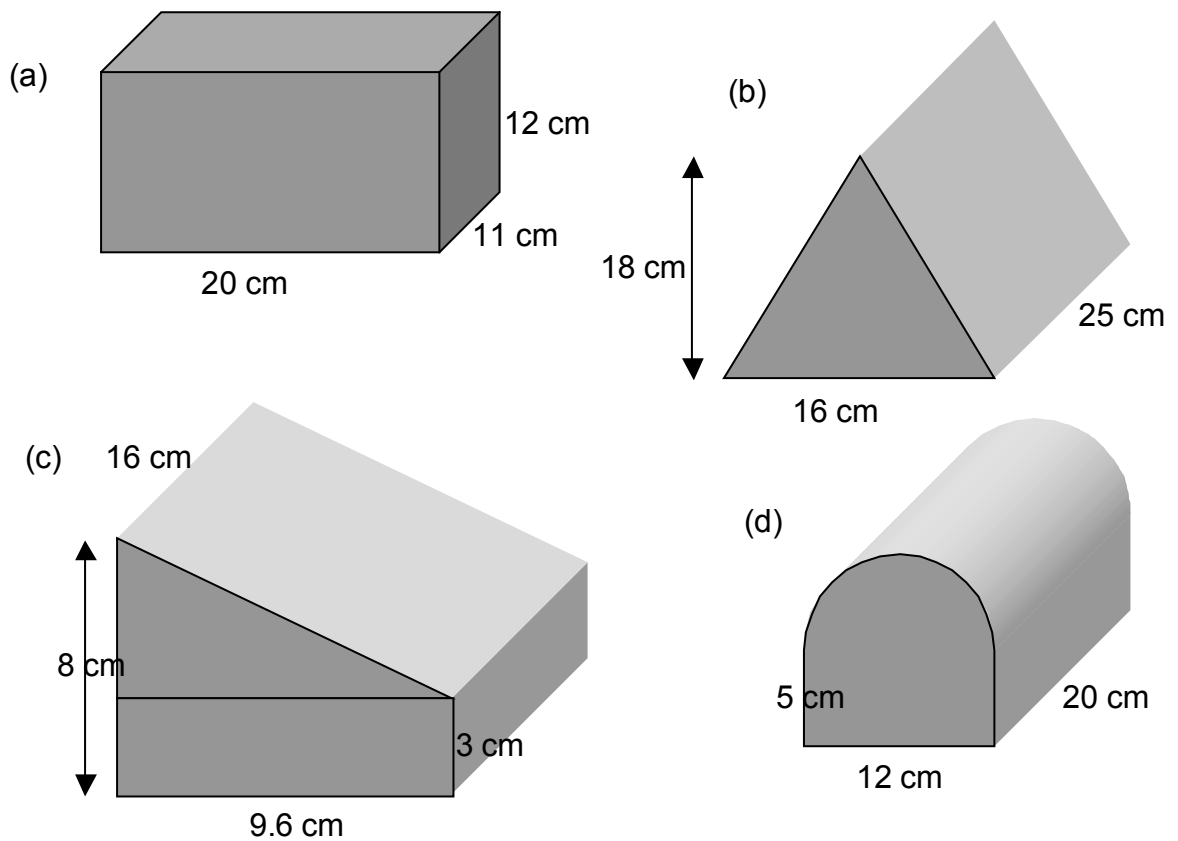


- (a) Where is Bus 2 at 4.05 pm?
- (b) How long does it take Bus 4 to travel from Preston to Grantham?
- (c) Bus 3 is 18 minutes early arriving at Grantham. At what time does it arrive at Grantham?

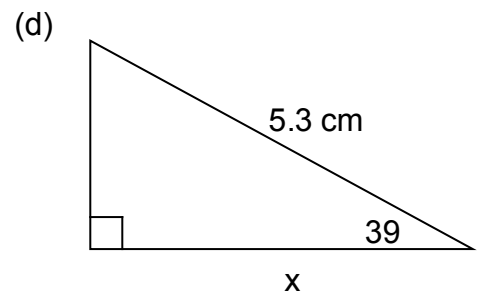
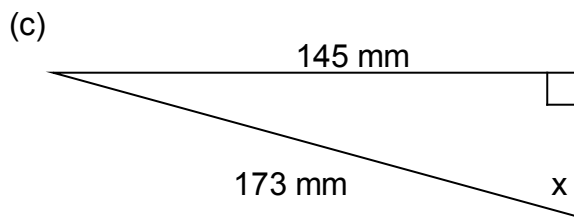
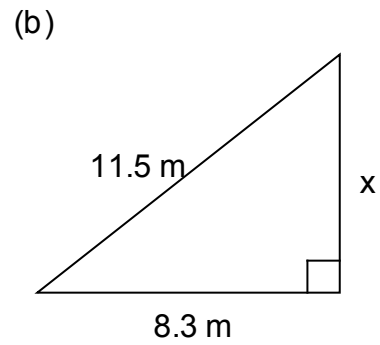
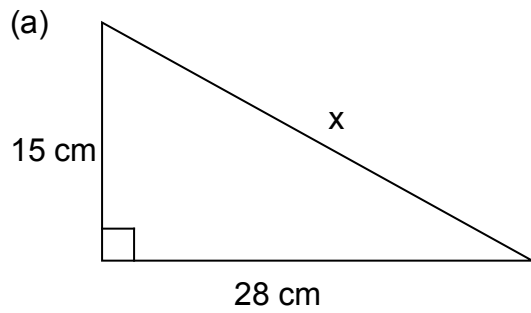
32. Calculate the area of each shape below.



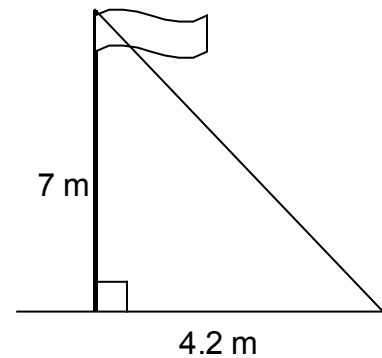
33. Calculate the volume of each shape below.



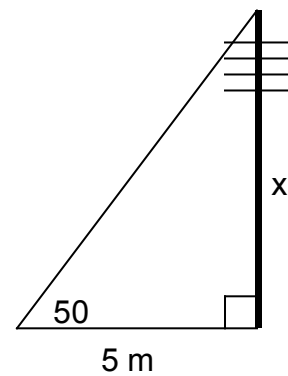
34. Calculate  $x$  in each of the following



35. A flagpole 7 metres high is connected to the ground by a metal wire. If the bottom of the wire is 4.2 metres from the flagpole, calculate the length of the wire.



36. From a distance of 5 metres from its base, the angle of elevation to top of a telegraph pole is  $50^\circ$ . Calculate  $x$ , the height of the pole.



37. Laura goes to France on holiday. She changes £650 into euros at a rate of £1 = 1.22 euros. Calculate the number of euros Laura will get.
38. Umran goes to the USA on holiday. He changes £900 into dollars at the rate of £1 = \$1.55. While on holiday he spends 1100 dollars and then changes the rest back to pounds at the rate of £1 = \$1.62.  
How much will he get , to the nearest pound.

39. Find the annual cost of insuring a house valued at £125 000 given an insurance rate of £3.25 per £1000.



40. Natalie has a painting she wants to insure. The painting is valued at £7500 and the insurance company charge £4.20 per £500.  
If Natalie pays the premium by 12 equal monthly instalments, calculate the size of each instalment.



41. Calculate the simple interest on a sum of £2520 at 5.3% pa for a period of 8 months.

42. Calculate the total amount that will be owed after 18 months on a loan of £10 000 when interest is charged at 8% per annum.

43. In a case of 160 apples, 18 of the apples are rotten. What percentage of the apples are rotten.



44. A computer costing £690 is sold in a sale for £450.  
Calculate the saving on the computer as a percentage.

45. Michael is a mechanic. He normally works from 8 a.m. to 4 p.m., Monday to Friday, but sometimes works overtime for which he is paid time and a half.  
His hourly wage is £8.60.

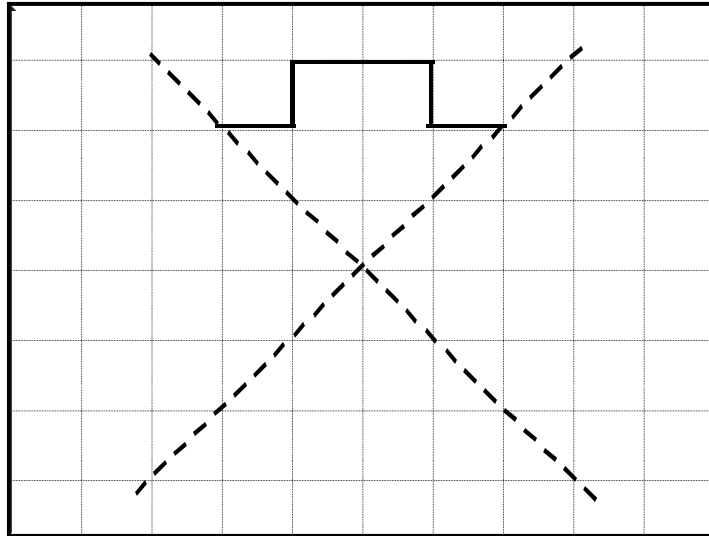
One week Michael worked the following hours.

Day	Start	Finish
Monday	8 a.m.	4 p.m.
Tuesday	8 a.m.	5 p.m.
Wednesday	7 a.m.	5 p.m.
Thursday	7 a.m.	5.30 p.m.
Friday	8 a.m.	4.30 p.m.



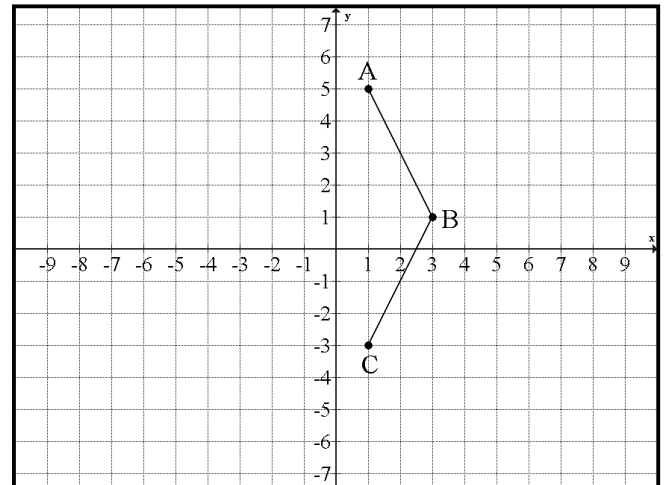
Calculate Michael's wage for this week.

46. Copy and complete the shape below so that the dotted lines are both lines of symmetry.

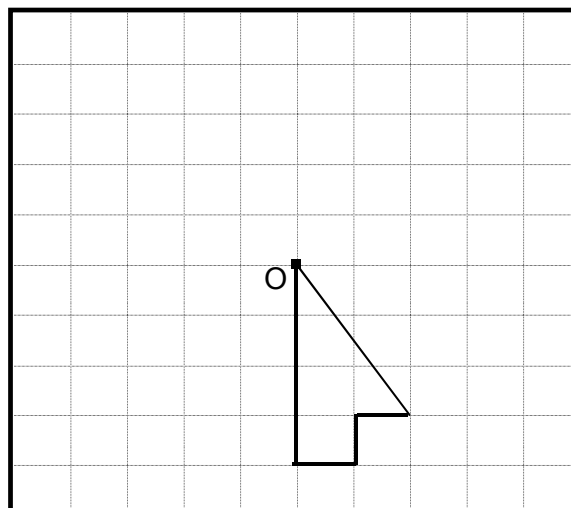


47. ABCD is a rhombus.  
A has coordinates (1,5), B is (3,1)  
and C is (1,-3).

- (a) Copy the diagram and plot the point D.  
(b) Find the image of ABCD after it has been reflected in the y-axis.



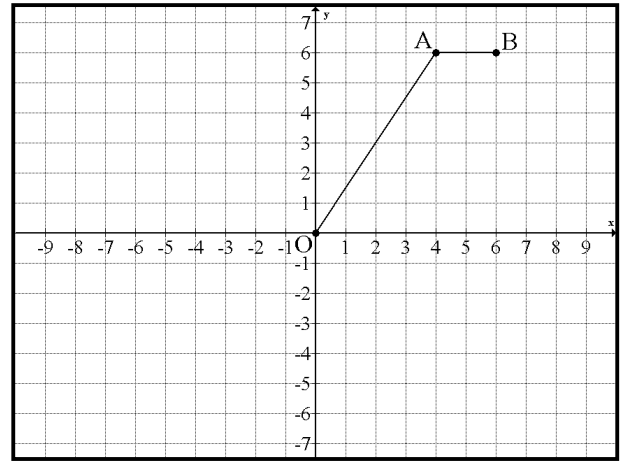
48. Copy and complete the shape below so that the shape has quarter turn symmetry about O.



49. A is the point (4,6) and B is the point (6,6).

(a) Copy the diagram and find the point C given OABC is a kite.

(b) Give the kite OABC a half-turn about the point O.



50. A train leaves Glasgow at 0935 and travels to London 621 km away at an average speed of 108 kmph. When will the train arrive in London.

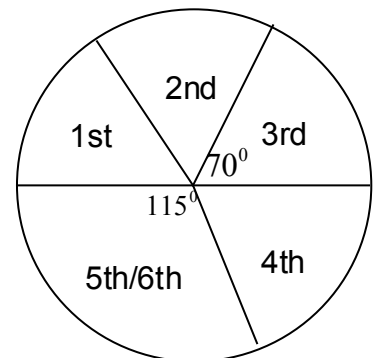
51. An aeroplane travels at an average speed of 620 kilometres per hour. Calculate the distance travelled by the aeroplane in a time of 3 hours and 45 minutes.



52. Glendale High School has a roll of 1800 pupils. The number of pupils in different years is given in the pie chart shown.

(a) How many pupils are in 3<sup>rd</sup> year?

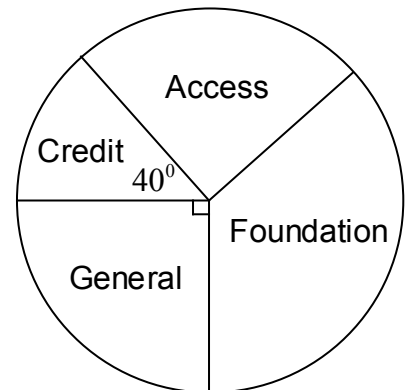
(b) How many pupils are in 5<sup>th</sup> or 6<sup>th</sup> year?



53. Last year 180 4<sup>th</sup> year pupils at Hollyside Academy sat national exams in Maths. The results are shown opposite.

(a) How many pupils sat Credit Maths?

(b) How many pupils sat general Maths?



54. The length of time patients wait in a doctor's surgery is recorded. The results are shown opposite.

Time (minutes)	No. of people
Less than 10	42
11 to 20	26
21 to 30	16
Over 30	6

Show this information in a pie chart.

55. The kinetic energy,  $K$  joules, of a rollercoaster varies directly as the square of its speed  $v$  metres per second. A rollercoaster travelling at a speed of 5 mps has kinetic energy 3125 joules.

What is the kinetic energy of the rollercoaster when it is travelling at a speed of 18 mps?

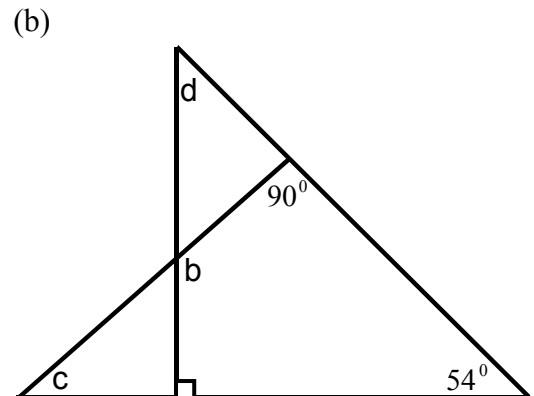
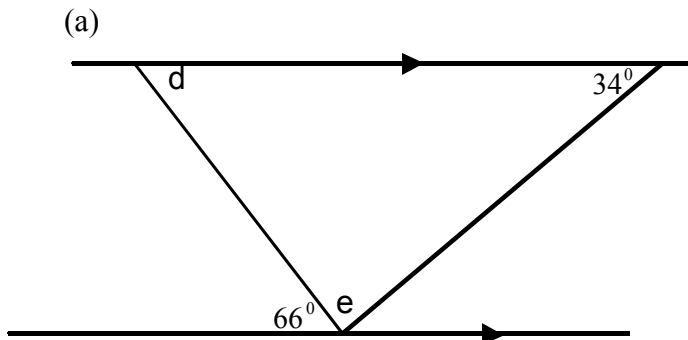
56. A printer charges his photocopying according to the number of copies supplied. The charge, £ $C$ , varies directly as the square root of the number of copies,  $N$ .



The charge for 576 copies is £4.32. What is the charge for 1225 copies?

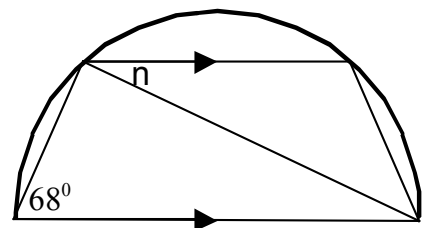
57. A computer operator working for a bank can type 7 warrants in a time of 35 minutes. How many warrants could the operator type in an hour and a half?

58. Find the lettered angles in each example below.

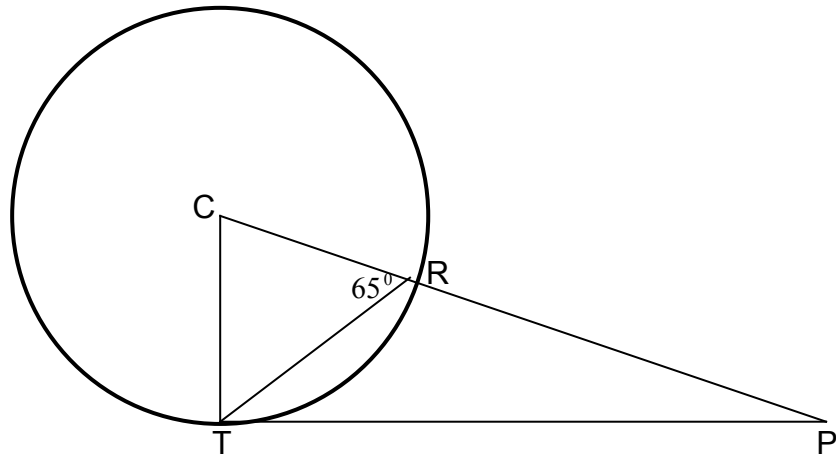


58. The diagram shows a semi-circular arch.

Calculate the size of angle  $n$ .



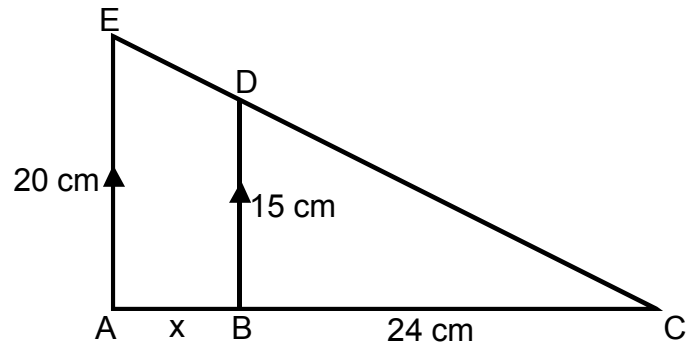
59. The diagram shows a circle with centre C.  
PT is a tangent to the circle.



Calculate the size of angle CPT.

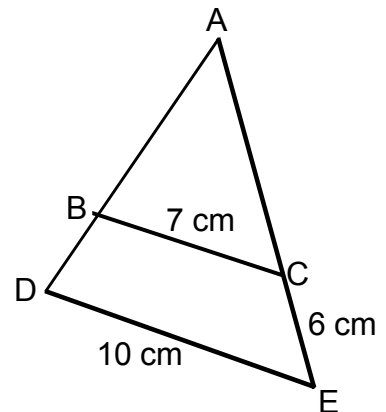
60. Triangles ACE and BCD are similar.

Calculate,  $x$ , the length of AB.



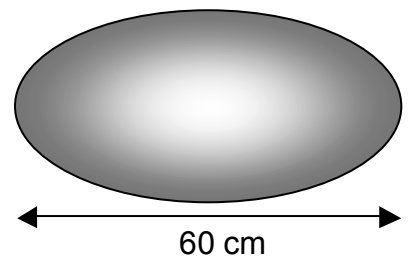
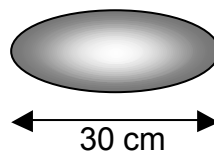
61. In the diagram opposite, triangles ABC and ADE are similar.  
BC = 7 cm, DE = 10 cm and CE = 6 cm.

Calculate the length of AC.



62. The diagram shows two mathematically similar mirrors.

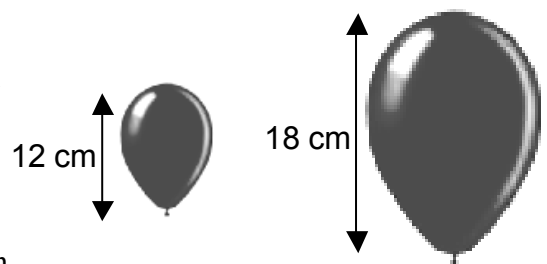
The smaller mirror has area  $2600 \text{ cm}^2$ .



Find the area of the larger mirror.

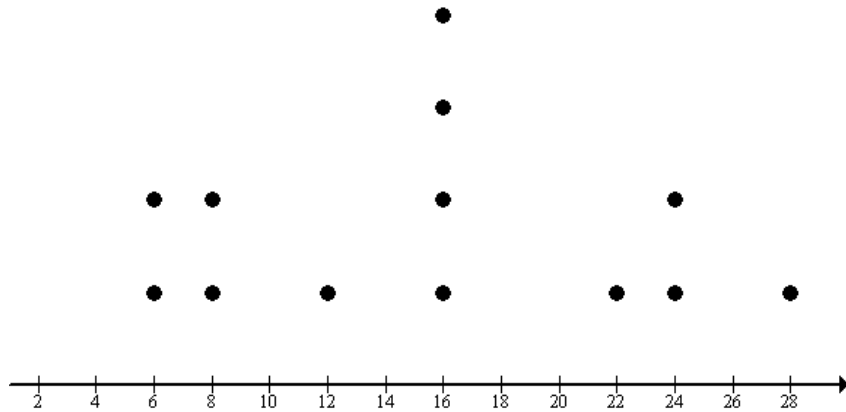
63. The balloons opposite are similar in shape.

The larger balloon has surface area  $1350 \text{ cm}^2$ .



Find the surface area of the smaller balloon.

64. A batch of watches is checked to see how many seconds each watch gains over a given period. The dot plot shows these gains.



- (a) Calculate the mean gain.  
 (b) Find the median gain.

65. The shoe size of 30 boys is given below.

Shoe size	No. of boys	Shoe size x no. of boys
6	4	
7	7	
8	13	
9	3	
10	3	

- (a) Copy and complete the table above.  
 (b) Find the mean shoe size.

66. An estate agent lists the annual income of a number of clients, together with the value of house they buy.

Client	A	B	C	D	E	F	G
Income in £1000s (L)	35	50	25	22	18	24	28
House value in £1000s (V)	68	98	42	35	45	46	56



- (a) Show this information in a scattergraph.  
 (b) Draw a line of best fit on your diagram.  
 (c) Use your line to estimate the value of a house bought by Amy whose income is £38 000.