



- 1 A train leaves Zurich at 22 40 and arrives in Vienna at 07 32 the next day.

Work out the time the train takes.

..... h ..... min [1]

- 2 In a box of 80 glasses, 3 are broken.

Work out the percentage of broken glasses in the box.

..... % [1]

- 3 Here is a list of numbers.

Put a ring around the number with the largest value.

0.3030       $\frac{1}{3}$       0.0330       $\frac{3}{10}$       33%      [1]

- 4 Chai says that  $8 \text{ cm}^2$  is the same as  $80 \text{ mm}^2$ .

Explain why Chai is wrong.

..... [1]

5  $y = mx + c$ .

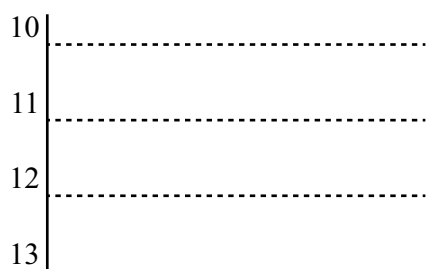
Find the value of  $y$  when  $m = -2$ ,  $x = -7$  and  $c = -3$ .

$y = \dots\dots\dots$  [2]

6 The number of cars parked in a car park at 9 am is recorded for 10 days.

124      130      129      116      132      120      127      107      118      114

Complete the stem-and-leaf diagram.



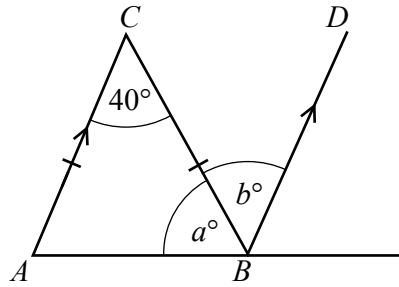
Key: 12|3 represents 123 cars

[2]

7 **Using a ruler and pair of compasses only**, construct a triangle with sides 5 cm, 8 cm and 10 cm.  
Leave in your construction arcs.

[2]

8



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Triangle  $ABC$  is isosceles.  
 $AC$  is parallel to  $BD$ .

Find the value of  $a$  and the value of  $b$ .

$a =$  .....

$b =$  ..... [2]

9 Rearrange the formula  $5w - 3y + 7 = 0$  to make  $w$  the subject.

$w =$  ..... [2]

10 Explain why  $\sqrt{3}$  is irrational.

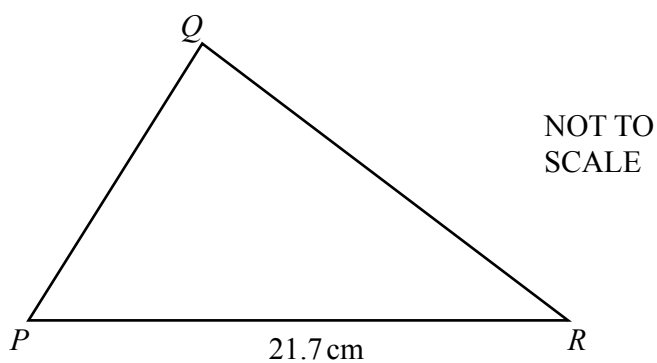
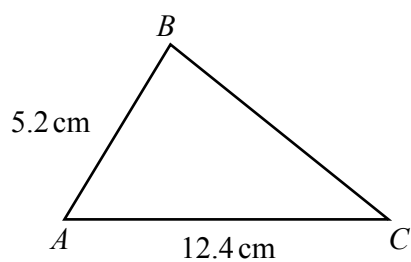
..... [1]

- 11 The mass,  $m$  kilograms, of a horse is 429 kg, correct to the nearest kilogram.

Complete this statement about the value of  $m$ .

$$\dots\dots\dots \leq m < \dots\dots\dots [2]$$

- 12 Triangle  $ABC$  is similar to triangle  $PQR$ .



Find  $PQ$ .

$$PQ = \dots\dots\dots \text{ cm } [2]$$

- 13 Solve the inequality  $n + 7 < 5n - 8$ .

$$\dots\dots\dots [2]$$

- 14** Without using your calculator, work out  $1\frac{7}{12} + \frac{13}{20}$ .

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

- 15** Here is a sequence of numbers.

7, 5, 3, 1, -1, ...

- (a) Find the next term in this sequence.

..... [1]

- (b) Find an expression for the  $n$ th term of this sequence.

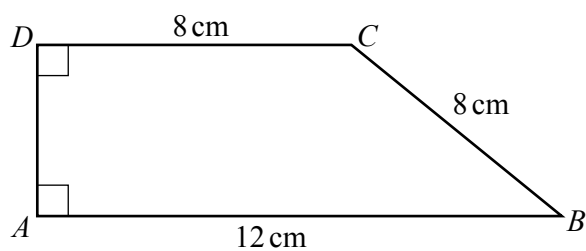
..... [2]

- 16** A hexagon has five angles that each measure  $115^\circ$ .

Calculate the size of the sixth angle.

..... [3]

- 17 Calculate the area of this trapezium.

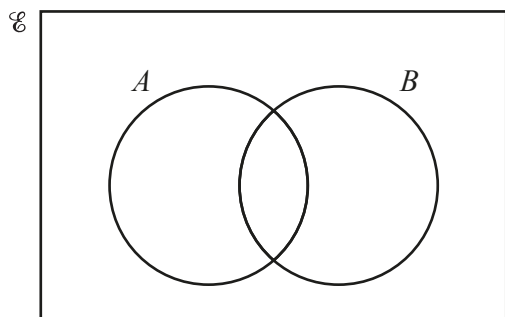


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.....cm<sup>2</sup> [4]

- 18 Shade the region in each of the Venn diagrams below.

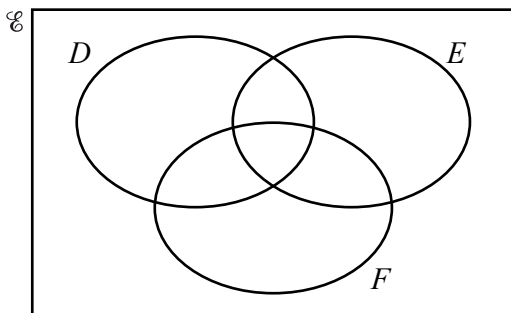
(a)



$A' \cup B$

[1]

(b)



$(D \cap E)' \cap F$

[1]

- 19 Use a calculator to find the decimal value of  $\frac{\sqrt{29-3 \times 32^{0.4}}}{3}$ .

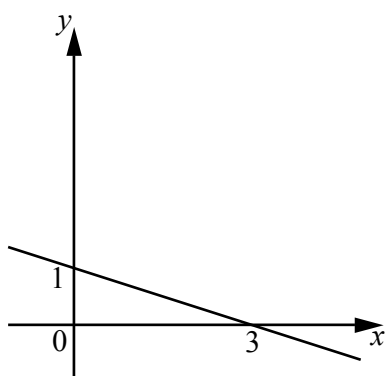
..... [1]

- 20 Write the recurring decimal  $0.3\dot{2}$  as a fraction.  
You must show all your working.

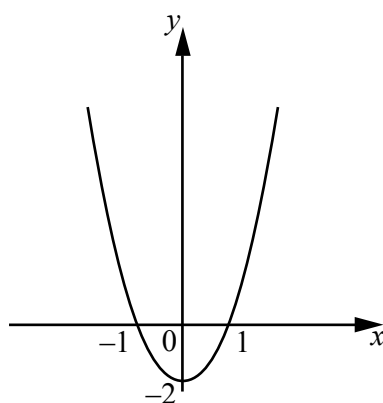
..... [2]



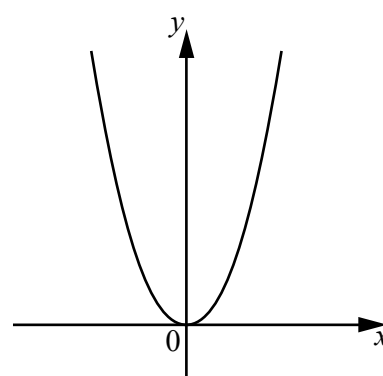
21 The diagrams A, B, C, D, E and F are six graphs of different functions.



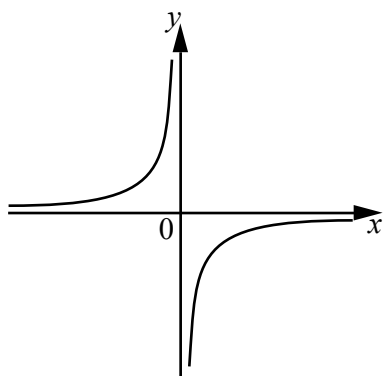
A



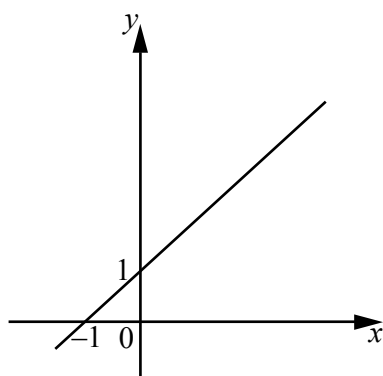
B



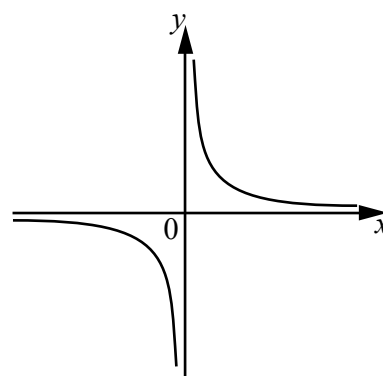
C



D



E



F

Complete the table to identify the correct graph for each function.  
One has been done for you.

Function	$y = x + 1$	$y = 1 - \frac{x}{3}$	$y = 2x^2$	$y = -\frac{4}{x}$
Diagram	E			

[3]

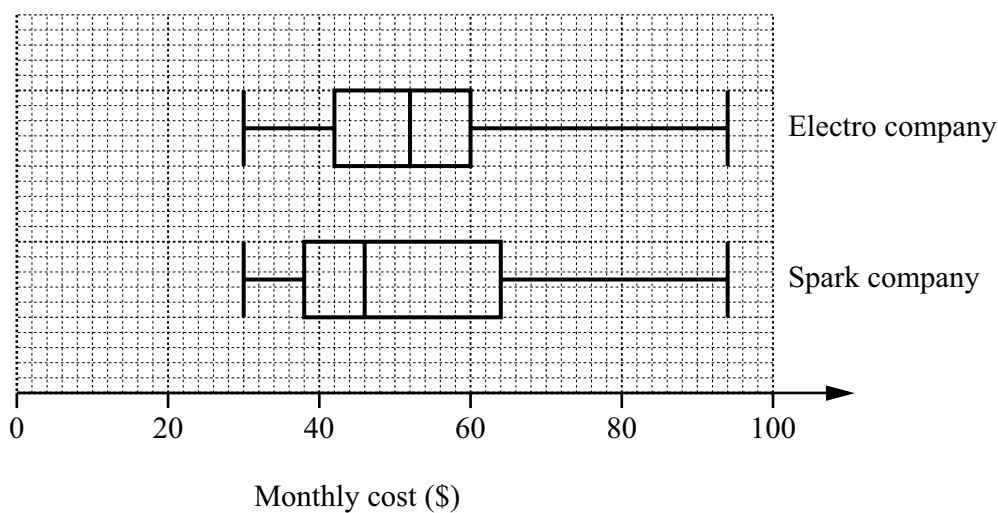
- 
- First match
- Second match
- win  $\frac{1}{3}$
- lose  $\frac{2}{3}$
- win  $\frac{3}{4}$
- lose  $\frac{1}{4}$
- win  $\frac{3}{4}$
- lose  $\frac{1}{4}$

..... [3]

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$$k = \dots [3]$$

- 24 These box-and-whisker plots show the monthly electricity costs for 100 different households who use Electro company or Spark company.



Tom says that the monthly costs with Electro company are lower and vary less than with Spark company.

Is Tom correct?

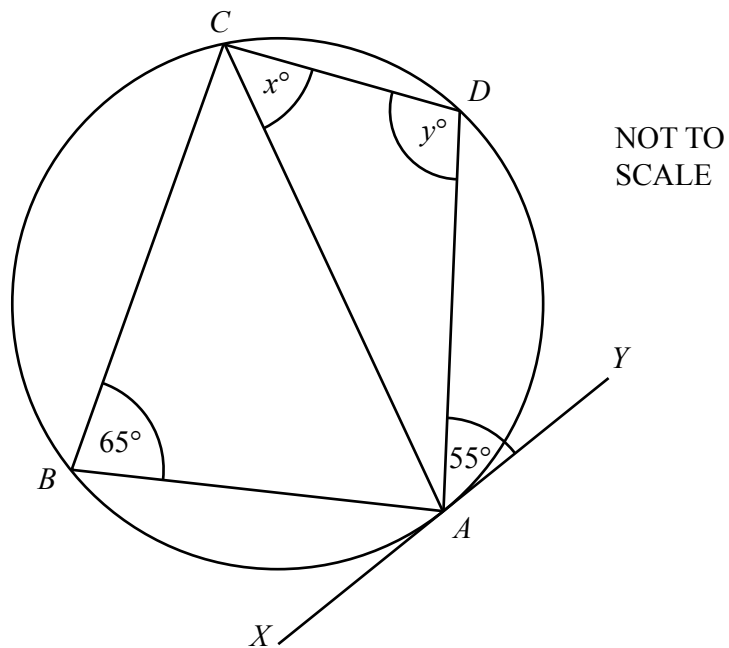
Justify your answer with reference to the box-and-whisker plots.

[4]

- 25 Find the turning point of  $y = x^2 + 4x - 3$  by completing the square.

( ..... , ..... ) [4]

26



$A, B, C$  and  $D$  are points on the circumference of the circle.  
The line  $XY$  is a tangent to the circle at  $A$ .

- (a) Find the value of  $x$ , giving a reason for your answer.

$x = \dots\dots\dots$  because  $\dots\dots\dots$   
 $\dots\dots\dots$  [2]

- (b) Find the value of  $y$ , giving a reason for your answer.

$y = \dots\dots\dots$  because  $\dots\dots\dots$   
 $\dots\dots\dots$  [2]

27 (a) Simplify  $(27x^6)^{\frac{1}{3}}$ .

..... [2]

(b) Find the value of  $(64x^4)^{0.5} \times 4x^{-2}$ .

..... [3]

28 Solve the simultaneous equations.  
You must show all your working.

$$\begin{aligned} y &= 5x^2 + 4x - 19 \\ y &= 4x + 1 \end{aligned}$$

$x =$  .....  $y =$  .....

$x =$  .....  $y =$  ..... [5]

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