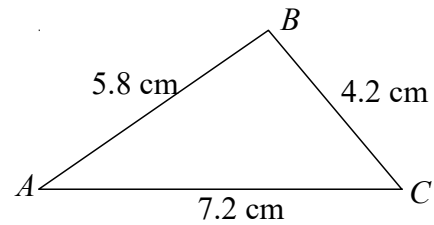


Higher (Grade 7-9) GCSE Mini Test 4

1

Solve $\frac{7}{x-3} + \frac{10}{x+1} = 3$

2



Work out the size of angle BAC .
Give your answer to 3 significant figures.

3 The function f is defined such that

$$f(x) = x^2 + 2x - 5$$

Find an expression for $f(x - 2)$

4

Rationalise the denominator $\frac{6}{\sqrt{2}}$

5

Show that the equation $2x^3 - 3x = 2$ has a solution between $x = 1$ and $x = 2$

6

y is directly proportional to the square of x

When $y = 15$, $x = 5$

Find the value of y when $x = 10$

7

$$v = \frac{s}{t}$$

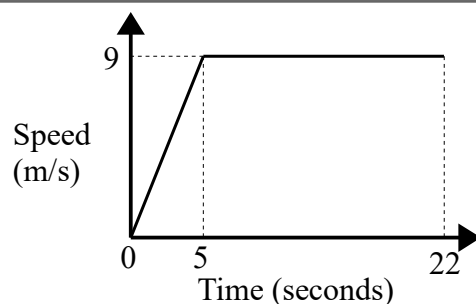
$s = 4.15$ correct to 2 decimal places

$t = 2.8$ correct to 1 decimal place

Work out the upper bound for v .

Give your answer to 2 decimal places.

8



Calculate the acceleration in the first 5 seconds.

9

A circle has the equation $x^2 + y^2 = 13$

(i) Write down the coordinates of the centre of the circle.

(ii) Write down the exact length of the radius of the circle.

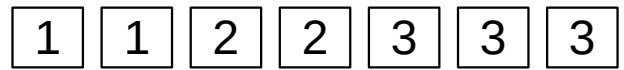
10

The coordinates of the maximum point of a curve are $(1, 5)$

Write down the coordinates of the maximum point of the curve with equation $y = f(x - 2) + 3$

11 Prove that $(2n + 3)^2 - (2n - 3)^2$ is always a multiple of 12, for all positive integer values of n .

12 Here are seven number cards.



Helen takes a card at random.
She does not replace the card.

Helen then takes another card at random.

Calculate the probability that both cards have the same number on them.

13 Solve $x^2 + x - 30 \leq 0$

14 Solve the simultaneous equations:

$$x^2 + y^2 = 29$$

$$2x - y = 8$$

15 By completing the square, find the turning point of the graph with equation $y = x^2 - 4x - 9$

16 Prove algebraically that the recurring decimal $0.5\dot{7}$ can be written as $\frac{26}{45}$

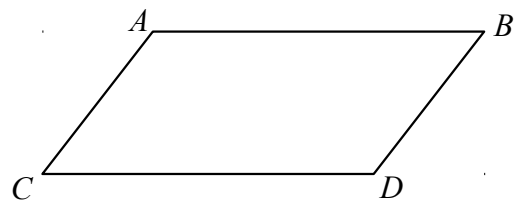
17 Cylinder A and Cylinder B are mathematically similar.

The length of Cylinder A is 10 cm and the length of Cylinder B is 12 cm.

The total surface area of Cylinder A is 75 cm^2 .

Calculate the total surface area of Cylinder B.

18 $ABCD$ is a parallelogram



Prove that triangle ABC is congruent to triangle BCD .

19 Here are the first 5 terms of a quadratic sequence.

2 9 18 29 42

Find an expression, in terms of n , for the n th term of this sequence.

20

Sketch the curve with equation $y = 2^x$

Give the coordinates of any points of intersection with the axes.