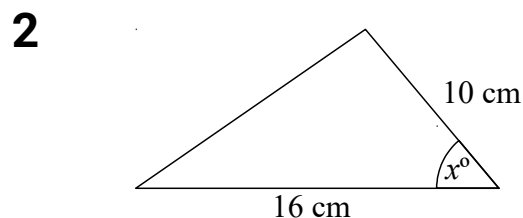


Higher (Grade 7-9) GCSE Mini Test 1

1 Simplify fully $\frac{3x^2 - 17x + 10}{x^2 - 7x + 10}$

$$\frac{3x - 2}{x - 2}$$



The area of the triangle is 55cm^2
 Work out the value of x .
 Give your answer to 1 decimal place. 43.4°

3 Given that $f(x) = 2x + 1$ and $g(x) = x^2 + 3$
 Find $fg(x)$

$$2x^2 + 7$$

4 Write $(4 + \sqrt{5})^2$ in the form $a + b\sqrt{5}$,
 where a and b are integers.

$$21 + 8\sqrt{5}$$

5 The number of people living in a town t years
 from now is P_t where

$$P_0 = 42000$$

$$P_{t+1} = 1.02(P_t - 550)$$

Work out the number of people in the town 3
 years from now.

$$42854$$

6 g is directly proportional to the square root of h

When $g = 4$, $h = 36$

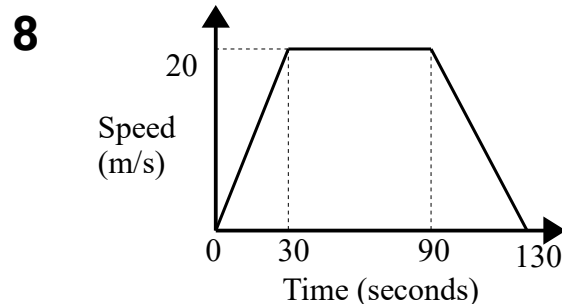
Find the value of h when $g = 2$

$$9$$

7 $a = \frac{b}{c}$
 $b = 9.37$ correct to 2 decimal places
 $c = 5.4$ correct to 1 decimal place

Work out the lower bound for a .
 Give your answer to 2 decimal places.

$$1.72$$



Calculate the total distance travelled. 1900 m

9 P is the point $(2,1)$ on the circle $x^2 + y^2 = 5$
 Work out the equation of the tangent to the
 circle at P .

$$y = -2x + 5$$

10 The coordinates of the turning point of a curve
 are $(1, 4)$

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

$$(-2, 4)$$

11 Prove that the sum of the squares of any two consecutive integers is always an odd number.

$$n^2 + (n+1)^2$$

$$n^2 + n^2 + 2n + 1$$

$$2n^2 + 2n + 1$$

$$2(n^2 + n) + 1$$

12 There are 10 counters in a bag.

6 of the counters are red.
4 of the counters are blue.

Two counters are taken at random from the bag.

Work out the probability that one counter of each colour are taken. $\frac{48}{90}$

13 Solve $x^2 + 10x + 21 \geq 0$

$$x \leq -7$$

or

$$x \geq -3$$

14 Solve the simultaneous equations:

$$y = x^2 + 3x - 18$$

$$x + 2y + 14 = 0$$

$$x = 2 \quad \text{or} \quad x = -5.5$$

$$y = -8 \quad \text{or} \quad y = -4.25$$

15 Write $x^2 + 10x + 5$ in the form $(x + a)^2 + b$ where a and b are integers.

$$(x + 5)^2 - 20$$

16 Prove algebraically that the recurring decimal $0.4\dot{0}\dot{9}$ can be written as $\frac{9}{22}$

$$x = 0.4\dot{0}\dot{9}$$

$$10x = 4.\dot{0}\dot{9}$$

$$1000x = 409.\dot{0}\dot{9}$$

$$990x = 405$$

$$x = \frac{405}{990}$$

$$x = \frac{9}{22}$$

17 Cylinder A and cylinder B are mathematically similar.

The length of cylinder A is 6 cm and the length of cylinder B is 12 cm.

The volume of cylinder A is 80 cm^3 .

Calculate the volume of cylinder B.

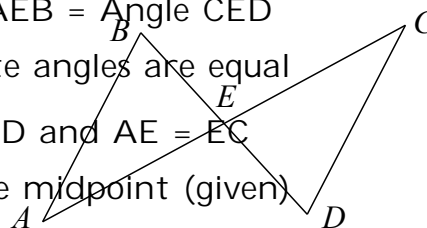
$$640 \text{ cm}^3$$

18 E is the midpoint of AC and BD .
Angle $AEB =$ Angle CED

Opposite angles are equal

$BE = ED$ and $AE = EC$

E is the midpoint (given)



SAS

Prove that triangle ABE and triangle CDE are congruent.

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

5 3 -1 -7 -15

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

$$-n^2 + n + 5$$

20

Sketch the graph of $y = \sin x^\circ$ for $0 \leq x \leq 360$

