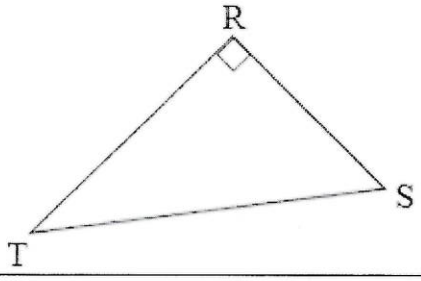
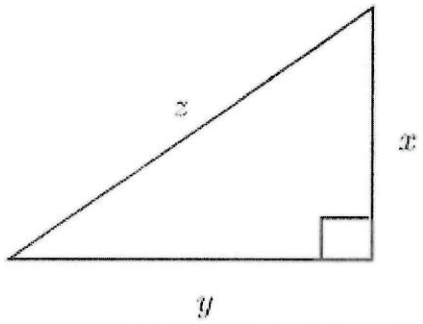
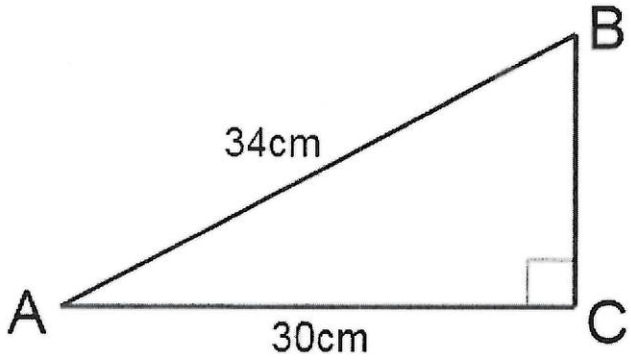
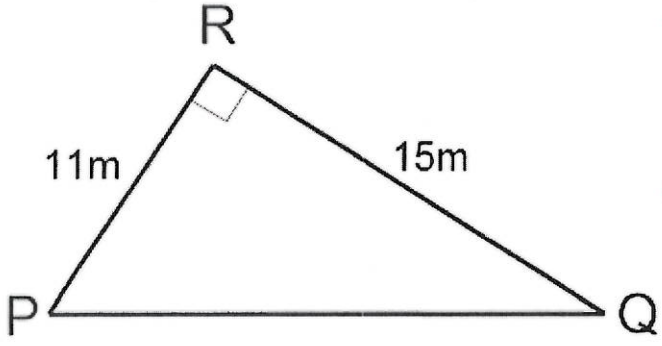
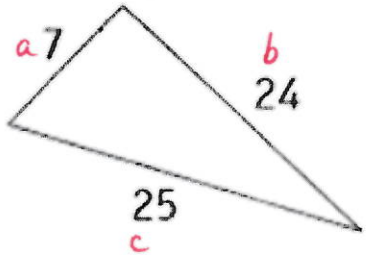
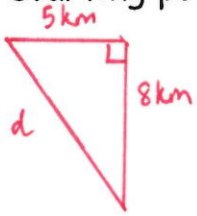
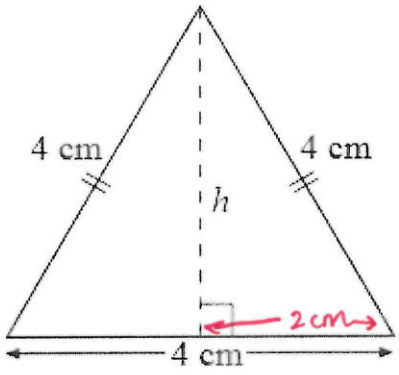
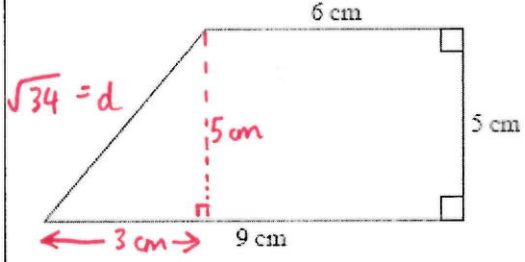
Pythagoras' Theorem Topic Test Name: _____

1.	What is the hypotenuse? The longest side in a right-angled triangle.	1
2.	Name the hypotenuse in the triangle below.  ST	1
3.	State Pythagoras' Theorem for this triangle.  $z^2 = x^2 + y^2$	1
4.	Find the length of BC.  $BC^2 + 30^2 = 34^2$ $BC^2 + 900 = 1156$ $-900 \quad -900$ $BC^2 = 256$ $BC = \sqrt{256}$ $= 16$	2
5.	Find the length of PQ to 2 decimal places.  $PQ^2 = 11^2 + 15^2$ $= 346$ $PQ = \sqrt{346}$ $= 18.60\text{m}$ (2 d.p.)	2

6.	Is the triangle below right-angled?  LHS $= c^2$ $= 25^2$ $= 625$ RHS $= a^2+b^2$ $= 7^2+24^2$ $= 625$ LHS = RHS $\therefore c^2 = a^2+b^2$ $\therefore$ the triangle is right-angled	2
7.	Two joggers run 8 km north and then 5 km west. What is the shortest distance, to the *nearest tenth* of a km, they must travel to return to their starting point?   $d^2 = 5^2+8^2$ $= 25+64$ $= 89$ $x = \sqrt{89}$ $= 9.4$ km (nearest tenth of a km) $\frac{1}{10} \times 1$km $= \frac{1}{10} \times 1000$ m $= 100$ m	
8.	Find the area of this triangle to 2 decimal places.  $h^2+2^2 = 4^2$ $h^2+4 = 16$ $h^2 = 12$ $h = \sqrt{12}$ cm A $= \frac{1}{2} \times 4 \times \sqrt{12}$ $= 6.93$ cm^2	2
9.	Find the perimeter of the trapezium below to 1 decimal place. Hint: Construct a right-angled triangle inside the trapezium.  $d^2 = 3^2+5^2$ $= 9+25$ $= 34$ $d = \sqrt{34}$ P $= 9+5+6+\sqrt{34}$ $= 25.8$ cm	
10.	Do the numbers 8, 13, 17 form a Pythagorean Triad?	

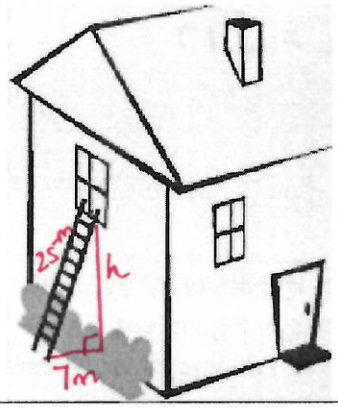
11. Circle the irrational numbers from the list below:

$$\sqrt{7},\ 5,\ -11,\ \sqrt{1},\ \sqrt{81},\ \pi,\ \frac{2}{3},\ -0.5,\ 12,\ \sqrt{20}$$

12. Circle the rational numbers from the list below:

$$\frac{3}{5},\ -\sqrt{7},\ -0.4,\ \sqrt{9},\ \sqrt{15},\ \sqrt{16},\ 2,\ 0.\dot{3},\ \sqrt{30}$$

13. A ladder leans against a window of a house. If the ladder is 25 m long, and the base of the ladder is 7m from the base of the house, how high is the window.



$h^2 + 7^2 = 25^2$

$h^2 + 49 = 625$

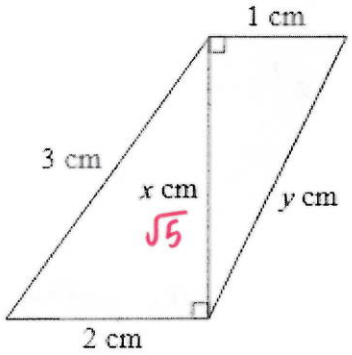
$h^2 = 576$

$h = \sqrt{576}$

$h = 24\text{m}$

∴ the window is 24m.

14. Find y. Leave your answer in exact form.



$x^2 + 2^2 = 3^2$

$x^2 + 4 = 9$

$x^2 = 5$

$x = \sqrt{5}$

$y^2 = 1^2 + (\sqrt{5})^2$

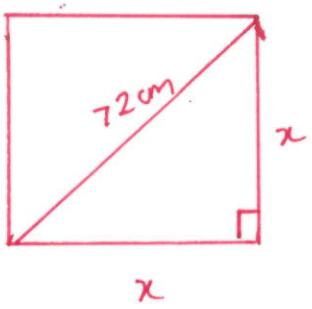
$= 1 + 5$

$= 6$

$y = \sqrt{6}$

CHALLENGE PAGE

15. Find the side length of a square with a 72 cm diagonal.



$x^2 + x^2 = 72^2$

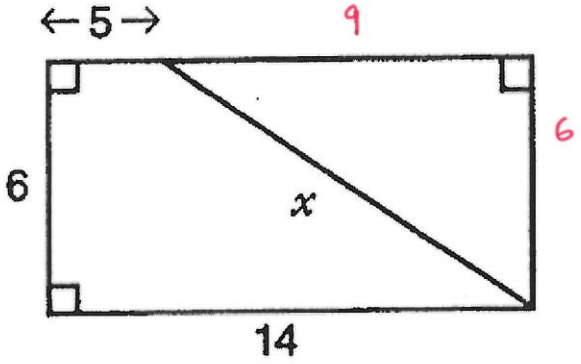
$2x^2 = 5184$

$x^2 = 2592$

$x = \sqrt{2592}$

$= 50.9\text{cm}$ (1 d.p.)

16. Find x.



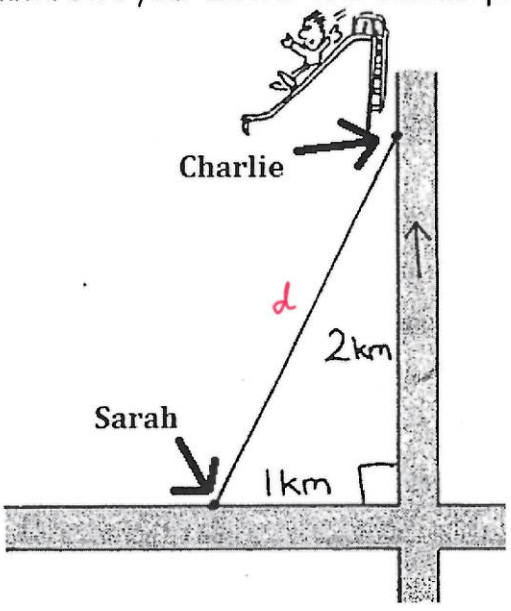
$x^2 = 9^2 + 6^2$

$= 81 + 36$

$= 117$

$x = \sqrt{117}$

17. Sarah wants to join her friend Charlie who is playing on the slippery dip. She can jog along the pathway to Charlie or run directly to her. The dots • represent Sarah and Charlie. Which is the shorter distance - running along the pathway or running directly and by how much. Give your answer to 2 decimal places.



running directly

$d^2 = 1^2 + 2^2$

$= 5$

$d = \sqrt{5}\text{ km}$

running along the pathway

$= 3\text{km}$

the shorter distance is the direct path by $(3 - \sqrt{5})\text{km} = 0.76\text{km}$

END OF TEST :)