High School Mathematics Test 2013

Year 8

Pythagoras Theorem

Non Calculator Section

Skills and Knowledge Assessed:

- Investigate Pythagoras' theorem and its application to solving simple problems involving right angled triangles (ACMMG222)
- Investigate the concept of irrational numbers, including π (ACMMG186)

Name_____

Answer all questions in the spaces provided on this test paper by:

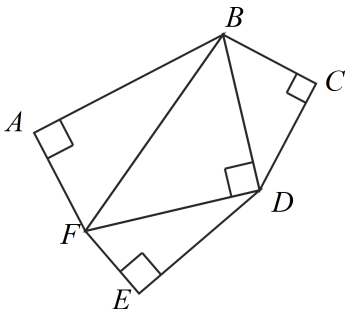
Writing the answer in the box provided.

or

Shading in the bubble for the correct answer from the four choices provided.

Show any working out on the test paper.

1. Which side is the hypotenuse of more than one triangle?



☐ *AB* ☐ *BD*

☐ *DF* ☐ *FB*

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2. Find the value of $\sqrt{13^2 - 12^2}$.

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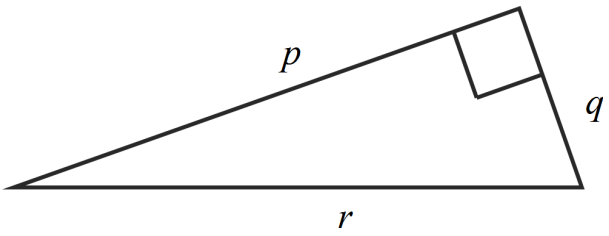
3. Write a statement of Pythagoras theorem for the triangle shown.



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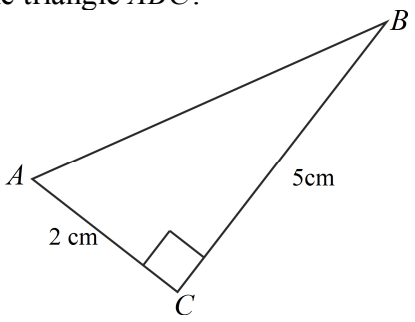
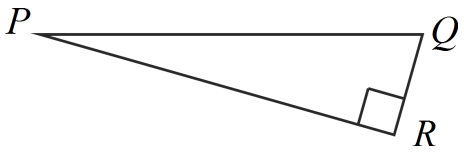
4. Which of the following is true about the length of AB in the triangle ABC?



- ☐ It is a whole number greater than 6.
- ☐ It is a whole number between 5 and 6.
- ☐ It is a rational number between 5 and 6.
- ☐ It is an irrational number between 5 and 6.

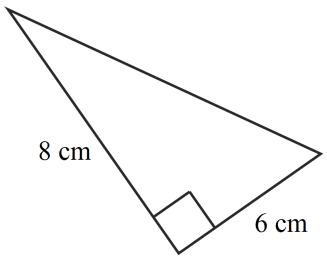
5. Which is a correct statement of Pythagoras Theorem for ΔPQR? ?



☐ $PQ^2 = PR^2 + QR^2$ ☐ $PR^2 = PQ^2 + QR^2$

☐ $QR^2 = PR^2 + PQ^2$ ☐ $PQ^2 = PR^2 - QR^2$

6. Find the length of the hypotenuse in the triangle shown.

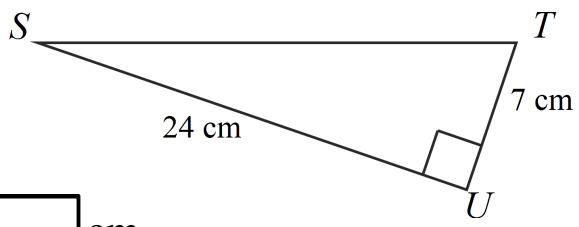


☐ cm

For questions 7 – 10 you may refer to the table of squares provided below.

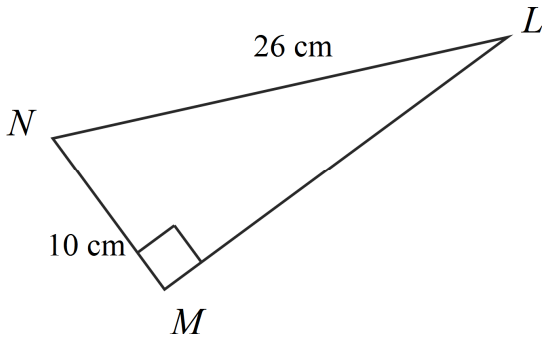
N	N^2	N	N^2
15	225	21	441
16	256	22	484
17	289	23	529
18	324	24	576
19	361	25	625
20	400	26	676

7. Find the length of ST in triangle STU.



$ST =$ ☐ cm

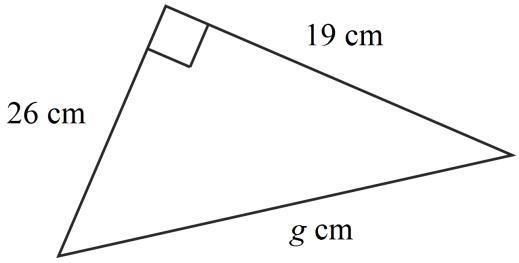
8. What is the length of LM in triangle LMN?



☐ 22 cm ☐ 23 cm

☐ 24 cm ☐ 25 cm

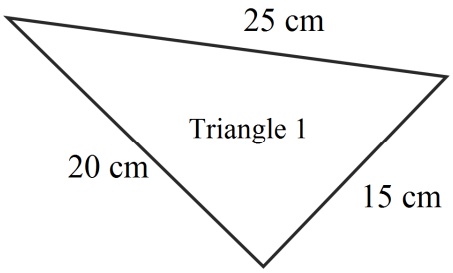
9. What is the value of g in the triangle shown ?

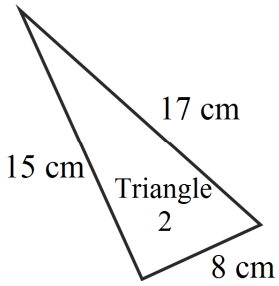


☐ $\sqrt{7}$ cm. ☐ $\sqrt{45}$ cm.

☐ $\sqrt{315}$ cm. ☐ $\sqrt{1037}$ cm.

10. Which of the triangles below are right angled?





☐ Both triangles are right angled.

☐ Neither triangle is right angled.

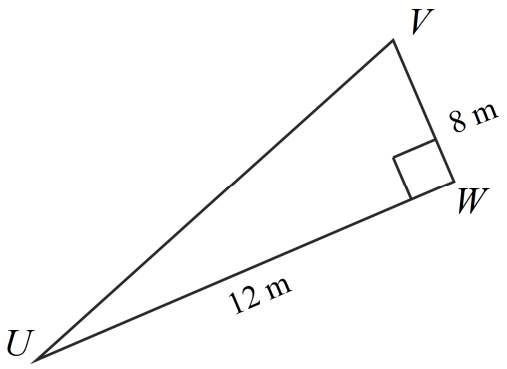
☐ Only triangle 1 is right angled.

☐ Only triangle 2 is right angled.

For questions 11– 12 you may refer to the table of squares roots provided below.

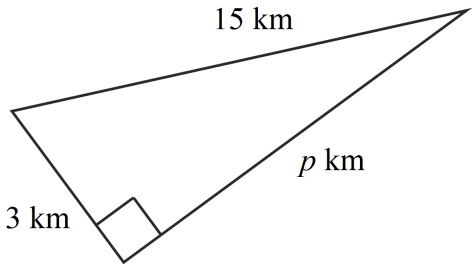
N	$\sqrt{N}$	N	$\sqrt{N}$
201	14.18	211	14.53
202	14.21	212	14.56
203	14.25	213	14.59
204	14.28	214	14.63
205	14.32	215	14.66
206	14.35	216	14.70
207	14.39	217	14.73
208	14.42	218	14.76
209	14.46	219	14.80
210	14.49	220	14.83

11. Find the length of UV in triangle UVW (correct to 2 decimal places).



$UV =$ ☐ m

12. What is the length of p in triangle shown? (Answer correct to 2 decimal places)



☐ 14.46 km ☐ 14.59 km

☐ 14.70 km ☐ 14.80 km

High School Mathematics Test 2013

Year 8

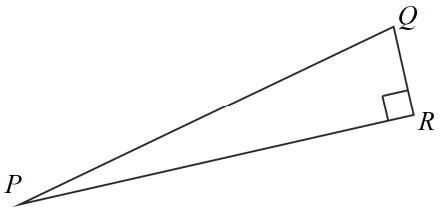
Pythagoras Theorem

Calculator Allowed Short Answer Section

Name_____

Answer all questions in the spaces provided on this test paper by:
Writing the answer in the box provided.
or
Shading in the bubble for the correct answer from the four choices provided.
Show any working out on the test paper. Calculators are allowed.

1. Name the hypotenuse of the triangle *PQR*.



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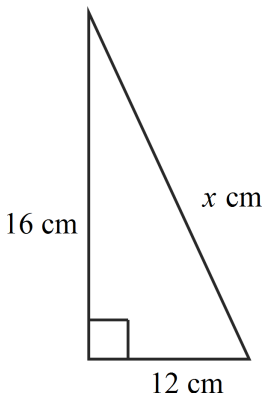
2. What is the value of x in the diagram of a right triangle?

☐ 11 cm ☐ 18 cm

☐ 20 cm ☐ 28 cm



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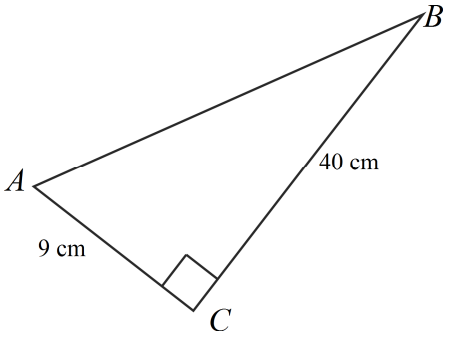
3. Find the length of the hypotenuse *AB* in the triangle *ABC*.

$AB =$ ☐ cm.



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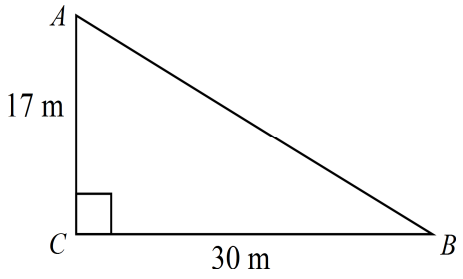
4. What is the length of AB in the triangle? (Answer correct to one decimal place.)

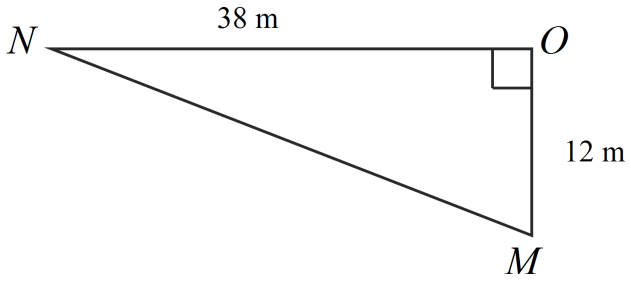
☐ 24.7 m ☐ 34.5 m

☐ 36.9 m ☐ 47.0 m



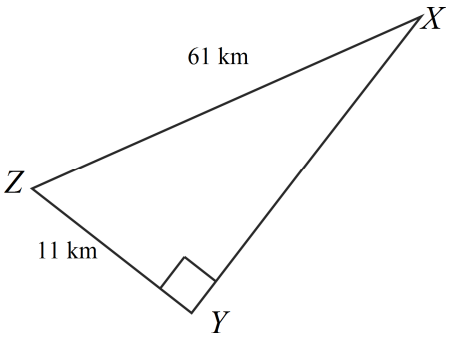
5. Calculate the length of MN in the triangle shown. (Answer correct to one decimal place.)

$MN =$ ☐ m



6. Find the length of the hypotenuse XY in the triangle XYZ.

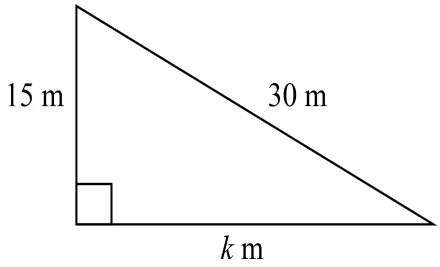
$XY =$ ☐ km.



7. What is the value of k in the diagram? (Answer correct to one decimal place.)

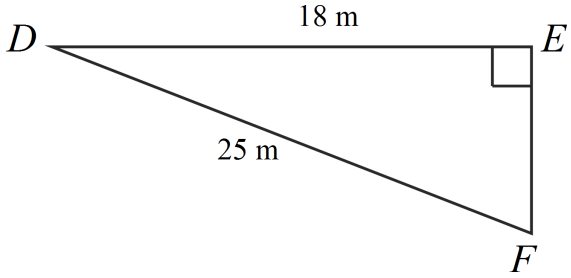
☐ 3.9 m ☐ 6.7 m

☐ 15.7 m ☐ 26.0 m



8. Calculate the length of MN in the triangle shown. (Answer correct to one decimal place.)

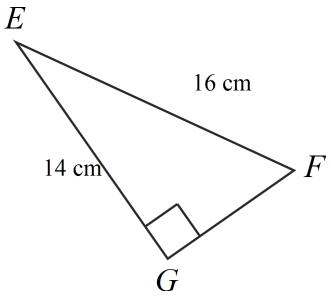
$EF =$ ☐ m



9. What is the length of FG in the triangle EFG?

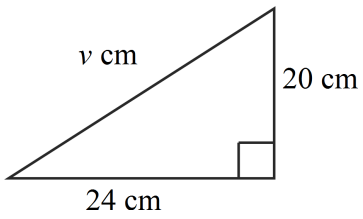
☐ $FG = \sqrt{2}$ cm. ☐ $FG = \sqrt{60}$ cm

☐ $FG = 60$ cm ☐ $FG = \sqrt{452}$ cm



10. What is the value of v in the diagram?
Leave your answer as a surd.

$v =$ ☐



11. Which of the following is a Pythagorean triad?
(A Pythagorean Triad is a set of three numbers which obey Pythagoras Theorem.)

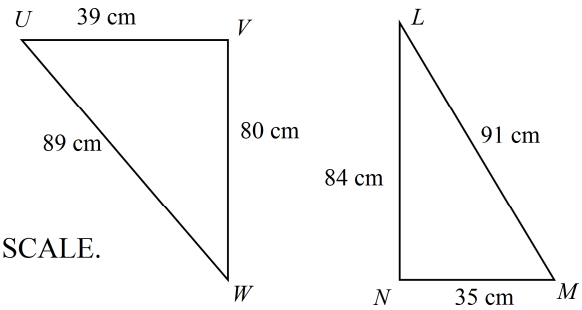
☐ (33, 56, 65) ☐ (33, 58, 65) ☐ (34, 56, 65) ☐ (33, 57, 66)

12. A Pythagorean triad has 48 and 90 as its two smaller numbers. What is the largest number?

☐

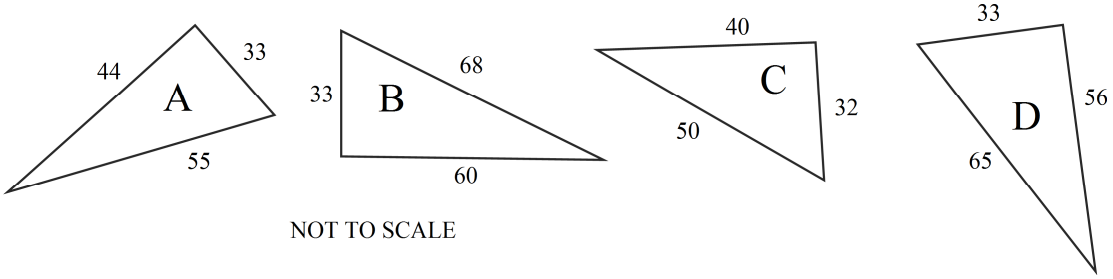
13. Which triangle is right angled?

☐ Both triangles.
☐ ΔLMN only.
☐ Neither Triangle.
☐ ΔUVW only.



NOT TO SCALE.

14. Which of these triangles are right triangles? (There are at least two which are.)

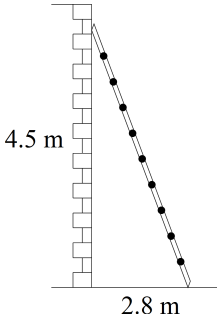


NOT TO SCALE

Write the letters of those which are right in the boxes. You do not need to fill all boxes.

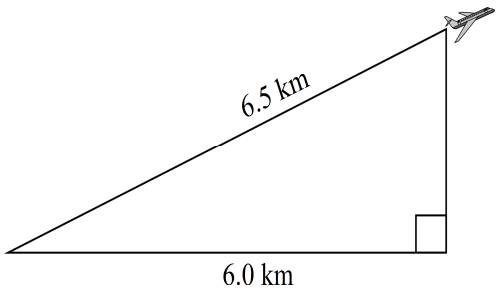
☐ ☐ ☐ ☐

15. What is the length of the ladder leaning against the wall?



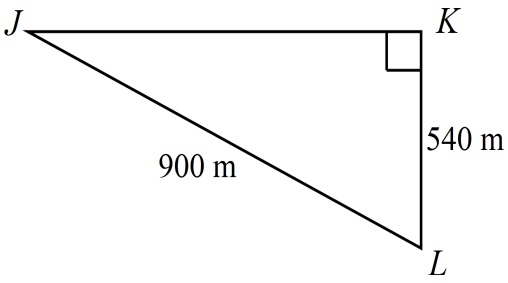
$\square$ m

16. The plane climbs at a constant angle until it is directly above a point which is 6.0 km from the place it left the ground.
At this point the plane has flown 6.5 km in a straight line, to the nearest 100 m.
Calculate the altitude of the plane above the ground.



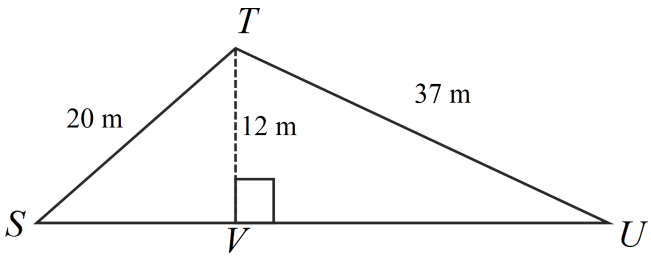
Altitude is $\square$ km.

17. Find the perimeter of the triangle *JKL*.



Perimeter is $\square$ m.

18. Find the area of ΔSTU.



Area = $\square$ m^2.

High School Mathematics Test 2013

Year 8

Pythagoras Theorem

ANSWERS

Non Calculator Section

1.	FB
2.	5
3.	$p^2 + q^2 = r^2$
4.	It is an irrational number between 5 and 6.
5.	$PQ^2 = PR^2 + QR^2$
6.	10 cm

7.	25 cm
8.	24 cm
9.	$\sqrt{1037}$ cm
10.	Both triangles are right angled.
11.	14.42 m
12.	14.70 km

Calculator Allowed Section

1.	PQ
2.	20 cm
3.	41 cm
4.	34.5 m
5.	39.8 m
6.	60 km
7.	26.0 m
8.	17.3 m
9.	$FG = \sqrt{60}$ cm
10.	$v = \sqrt{976}$
11.	(33, 56, 65)

12.	102
13.	Both triangles.
14.	A and D
15.	5.3 m
16.	2.5 km
17.	JK = 720 m; Perimeter = 2 160 m
18.	SV = 16 VU = 35 SU =51 Area = 306 m^2