Name: _____

NON- CALCULATOR SECTION (20 Marks)

1. What is the square of 4? [8N1.5]
   A) 2
   B) 4
   C) 8
   D) 16

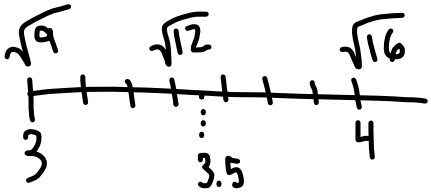
$(4)^2 = 4 \times 4 = 16$

2. What is the side length of a square with an area of $64mm^2$? [8N1.4]
   A) 8mm
   B) 16mm
   C) 32mm
   D) 128mm

Side length $= \sqrt{\text{Area}}$
$= \sqrt{64}$ ← what times itself equals 64?
$= 8$

3. What is the best estimate for $\sqrt{12}$? [8N2.1]
   A) 3.1
   B) 3.3
   C) 3.5
   D) 3.7

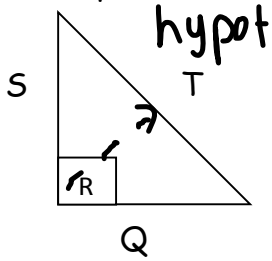
$\sqrt{9} = 3$ $\sqrt{16} = 4$



4. Which of the following is a perfect square number? [8N1]
   A) 56
   B) 72
   C) 99
   D) 121

Since 11 times itself is 121.
$11 \times 11 = 121$

5. Which letter below represents the hypotenuse of the right triangle? [8SS1]



hypothenuse

- across from right angle
- largest side of right triangle
- "c" in $a^2 + b^2 = c^2$

A) Q
B) R
C) S
D) T

6. Which is a Pythagorean triple? [8SS1.5]
A) 1,2,3
B) 4,5,6
C) 6,8,10
D) 7,8,11

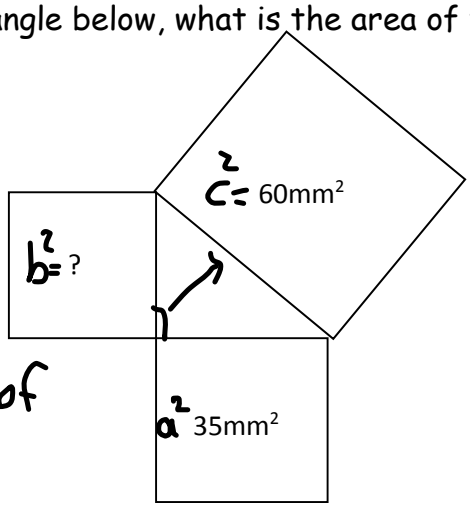
A) $1^2 + 2^2 \neq 3^2$
$1 + 4 \neq 9$
$5 \neq 9$

B) $4^2 + 5^2 \neq 6^2$
$16 + 25 \neq 36$
$41 \neq 36$

C) $6^2 + 8^2 = 10^2$
$36 + 64 = 100$
$100 = 100$ ✓

7. Given the right triangle below, what is the area of the indicated square?

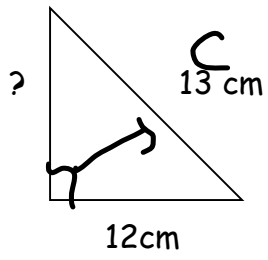
A) 5mm^2
B) 9.7mm^2
C) 25mm^2
D) 95mm^2



$b^2 = c^2 - a^2$
$b^2 = 60 - 35$
$b^2 = 25$

The sum of two smallest area equals the area of largest square.

8. What is the length of the missing side? [8SS1.2]



A) 1 cm
B) 5cm
C) 11 cm

finding the leg:

$b^2 = c^2 - a^2$
$b^2 = 13^2 - 12^2$
$b^2 = 169 - 144$
$\sqrt{b^2} = \sqrt{25}$
$\boxed{b = 5}$

D) 25cm

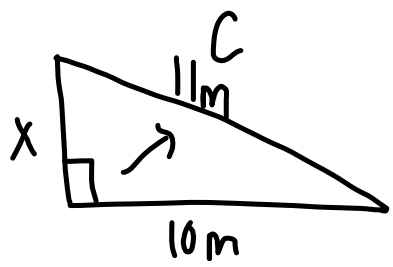
9. A ramp is 11m long. The horizontal distance it spans is 10m. What is the vertical height of the ramp, estimated to the nearest tenth of a meter?

A) 4.4 m [8SS1.2]

B) 4.6m

C) 14.8m

D) 15.0m



$b^2 = c^2 - a^2$

$b^2 = 11^2 - 10^2$

$b^2 = 121 - 100$

$\sqrt{b^2} = \sqrt{21}$

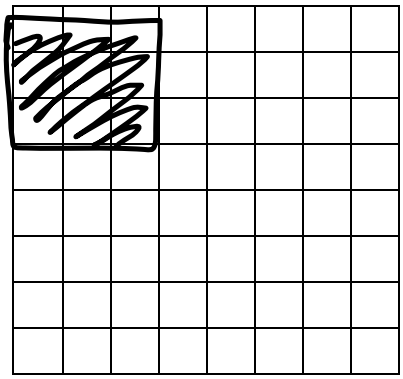
$\boxed{b = 4.6}$

Name: _____

CONSTRUCTED RESPONSE (25 MARKS)

Use of a calculator is permitted. SHOW ALL WORKINGS!!!

1. Using the grid below, model 9 as a perfect square. (2) [8N1.1]



Area of 9

Side length of 3.

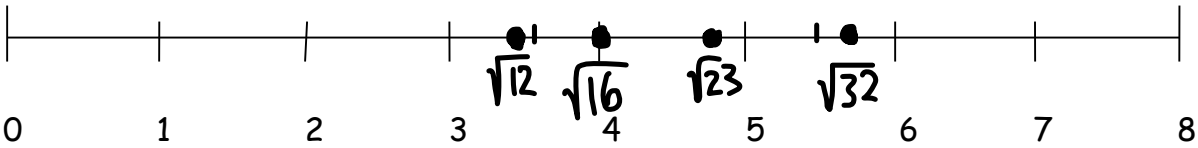
2. Place each square root on the number line to show its approximate value. (4)

A) $\sqrt{16}$ = 4

B) $\sqrt{32}$ $\sqrt{25}=5$ $\sqrt{36}=6$

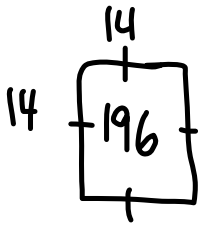
C) $\sqrt{12}$ $\sqrt{9}=3$ $\sqrt{16}=4$

D) $\sqrt{23}$ $\sqrt{16}=4$ $\sqrt{25}=5$ [8N2.1]



3. Use the method of your choice to show how 196 is a perfect square but 200 is not. (4) [8N1.2/3]

Since 14 times itself is 196 then 196 is a perfect square.



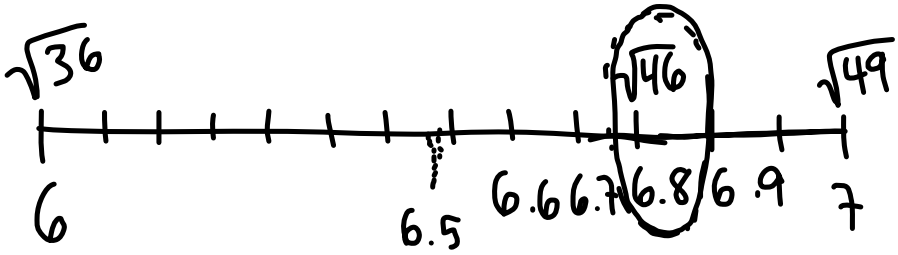
- 196 has an odd number of factors

You cannot multiply a number by itself to get 200.

- 200 has an even number of factors.

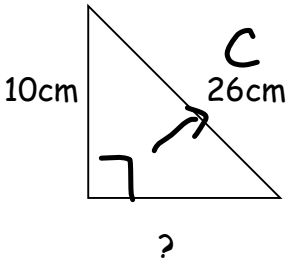
4. Explain how you would estimate $\sqrt{46}$ to the tenths position without using a calculator. (3) [8N2.1]

$\sqrt{36}=6$ $\sqrt{49}=7$



$\therefore \sqrt{46} \doteq 6.8$

5. Find the missing length.(3) [8SS1.2]



finding the leg:

$b^2 = c^2 - a^2$

$b^2 = 26^2 - 10^2$

$b^2 = 676 - 100$

$\sqrt{b^2} = \sqrt{576}$

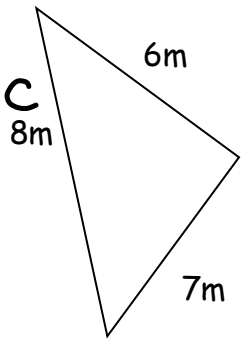
$\boxed{b = 24}$

6. Knowing only the side lengths, is the triangle below a right triangle? Explain how you know. (3) [8SS1.4]

$a^2 + b^2 \stackrel{?}{=} c^2$

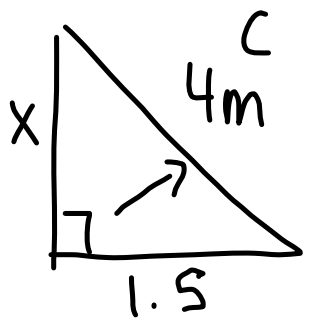
$6^2 + 7^2 \stackrel{?}{=} 8^2$

$36 + 49 \stackrel{?}{=} 64$



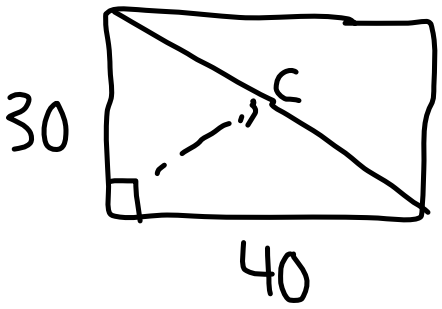
$85 \neq 64$ $\therefore$ it is not a right triangle.

7. Sam uses a 4m ladder to reach the eave along his roof. How high does the ladder reach up the side of the house, if the bottom of the ladder is 1.5m away from the house? (3) [8SS1.2]



$$b^2 = c^2 - a^2$$
$$b^2 = 4^2 - 1.5^2$$
$$b^2 = 16 - 2.25$$
$$\sqrt{b^2} = \sqrt{13.75}$$
$$\boxed{b = 3.7}$$

8. The dimensions of a rectangular frame is 30cm by 40cm. A carpenter wants to put a diagonal brace between the opposite corners. Find the length of the brace. Make a diagram to support your answer (3) [8SS1.5]



$$a^2 + b^2 = c^2$$
$$30^2 + 40^2 = c^2$$
$$900 + 1600 = c^2$$
$$\sqrt{2500} = \sqrt{c^2}$$
$$\boxed{c = 50}$$