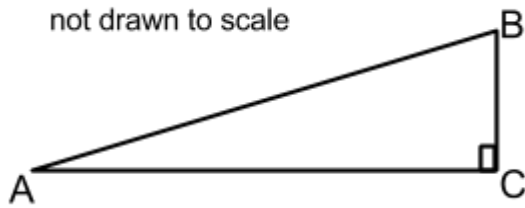**Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and mathematical problems in 2 and 3 dimensions, Practice Set A**

Name:

Date:

1. In right triangle, *ABC*, side *AC* is longer than side *BC*. The boxed numbers represent the possible side lengths of triangle *ABC*. Identify three boxed numbers that could be the side lengths of triangle *ABC*. Enter the number you chose to represent the length of each side. Explain how you know.
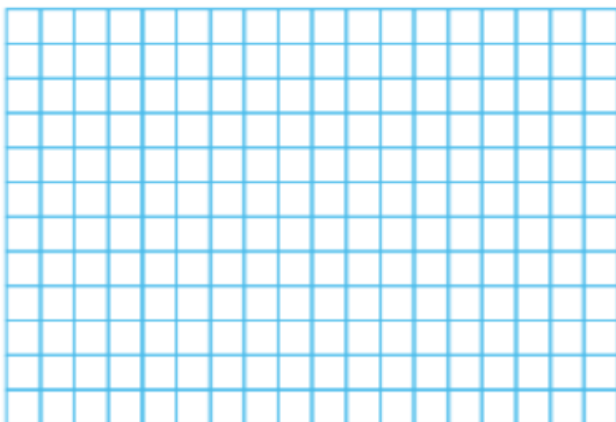
not drawn to scale

B

A   C

7, 8, 15, 17, 18, 20, 24, 25

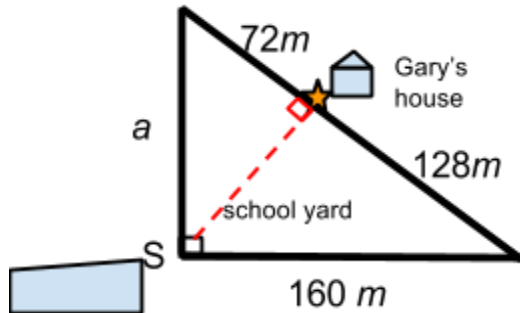a. *BC* = _____   b. *AC* = _____   c. *AB* = _____

2. On the grid below, draw a right triangle with whole number leg lengths and a hypotenuse of 10 *units*. Show algebraically that it is a right triangle.
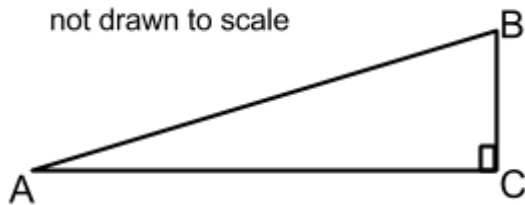
3. Gary always cuts across the school yard rather than walk along the road to get to the skateboard park. How much distance does Gary save by taking the shortcut?

72m

Gary's house

a

128m

school yard

S

160 m

Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and mathematical problems in 2 and 3 dimensions, Practice Set A

Answer Key

1. In right triangle, *ABC*, side *AC* is longer than side *BC*. The boxed numbers represent the possible side lengths of triangle *ABC*. Identify three boxed numbers that could be the side lengths of triangle *ABC*. Enter the number you chose to represent the length of each side. Explain how you know.

not drawn to scale

B

A   C

7, 8, 15, 17, 18, 20, 24, 25

a. $BC =$ _____ b. $AC =$ _____ c. $AB =$ _____

7   24   25

$7^2 + 24^2 = 25^2$ $49 + 576 = 625$ $625 = 625$

8   15   17

$8^2 + 15^2 = 17^2$ $64 + 225 = 289$ $289 = 289$

15   20   25

$15^2 + 20^2 = 25^2$ $225 + 400 = 625$ $625 = 625$
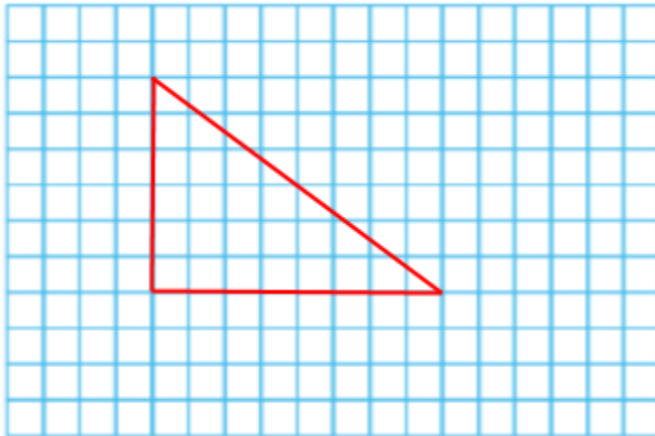
also a multiple of 3 - 4 - 5

Explanations will vary depending on the triple selected.

2. On the grid below, draw a right triangle with whole number leg lengths and a hypotenuse of 10 *units*. Show algebraically that it is a right triangle.
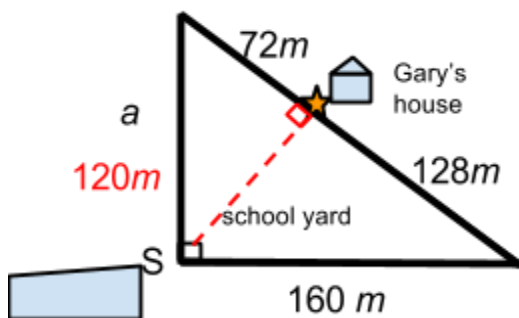
6 by 8 by 10

$6^2 + 8^2 = 10^2$

$36 + 64 = 100$

$100 = 100$

multiple of a 3-4-5 triangle

3. Gary always cuts across the school yard rather than walk along the road to get to the skateboard park. How much distance does Gary save by taking the shortcut?

$72m + 128m = 200m$

$200m$ and $160m$ are multiples of 5 and 4, respectively.
$5(40)$, $4(40)$, so $3(40)$ would be the missing side *a*.

The shortcut would be a leg of a right triangle with a hypotenuse of $120m$ and the other leg is $72m$. 120 and 72 are also multiples of a 3-4-5 right triangle.

$120 = 5(24)$ $72 = 3(24)$ so the shortcut would be $4(24) = 96m$

The shortest distance Gary could travel on the street would be $72m + 120m = 192m$.

$192m - 96m = 96m$

Gary would save $96m$ by cutting through the school yard.