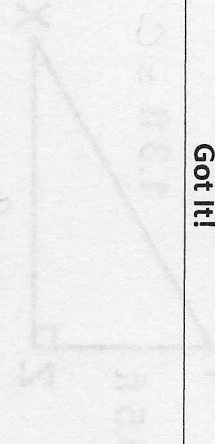Name: _____   Date: _____

Formative Assessment: Similar Triangles & Pythagorean Theorem (Solutions)

Expectations you're working on...

☐ Students will use their knowledge of ratio and proportion to ~~investigate similar triangles and solve problems related to similarity~~

☐ Students will solve problems involving right triangles using ~~the primary trigonometric ratios and~~ the Pythagorean Theorem

Still Learning...	Almost There...	Got It!

Communication Corner
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Part A—Knowledge & Understanding

1. Use the diagram to answer the following questions:

a) Which two triangles are similar?

$\triangle$ BDE and $\triangle$ BAC
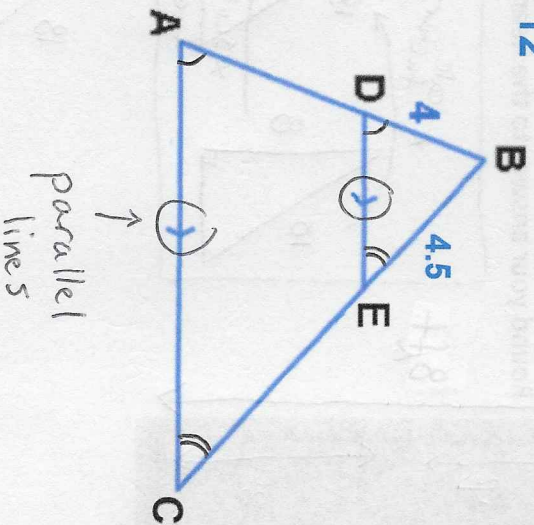
b) How do you know they are similar?

$\angle$ BDE = $\angle$ BAC $\Big\}$ Parallel lines

$\angle$ BED = $\angle$ BCA $\Big\}$

$\angle$ ABC = $\angle$ DBE (common angle)

AB = 12

parallel
lines

c) Use the fact that they are similar to find the length of BC. Show your work.

diagram

method 1:

$\times 3$

4 → 12 (Y triangle) 4.5, B, ?, C

Scale factor = 3
BC = 4.5 × 3 = 13.5

method 2: Set up a proportion

$$\frac{4}{12} = \frac{4.5}{BC}$$

$4BC = 54$

$$\frac{4BC}{4} = \frac{54}{4}$$
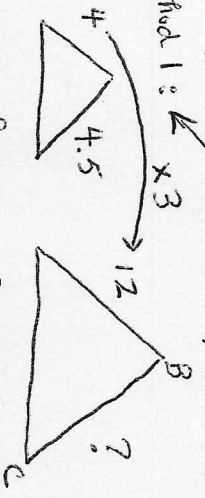
BC = 13.5

AB = 12

A, B, D, E, C   12   4   4.5   ?

2. Solve for the unknown length. Round your answers to one decimal place.

Y
Z ⊥
1.3 ft = c
b = 0.5 ft
a
X
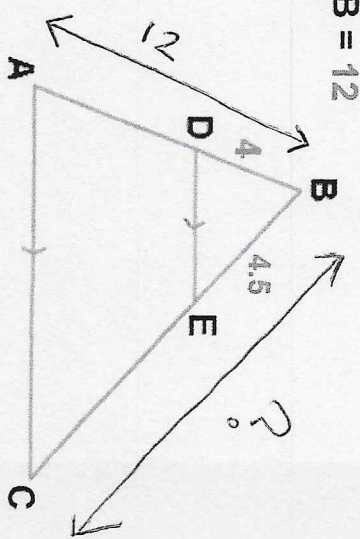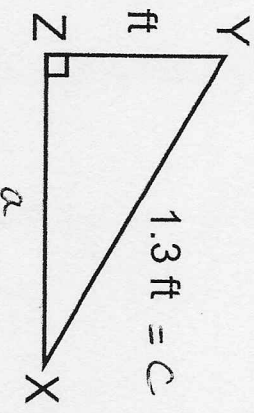
$c^2 = a^2 + b^2$
$1.3^2 = a^2 + 0.5^2$
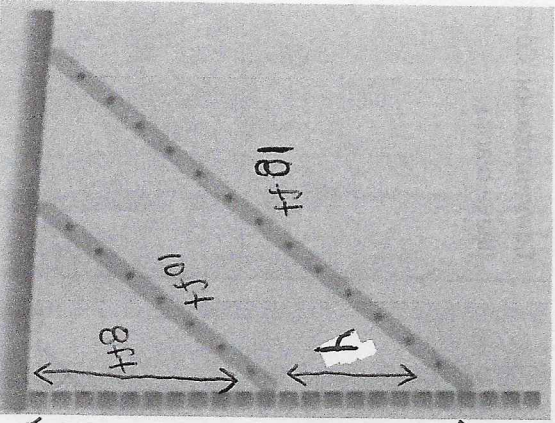$a^2 = 1.3^2 - 0.5^2$
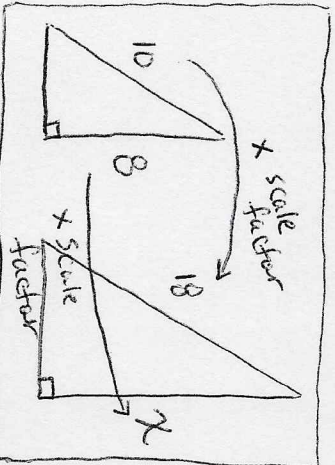$a^2 = 1.69 - 0.25$

$a^2 = 1.44$
$a = \sqrt{1.44}$
$a = 1.2$

Part B-Application

3. Two ladders are leaned up against a wall so that they make the *same angle*
with the ground. The 10-foot ladder reaches 8 feet up the wall. <u>How much</u>
<u>far up the wall does the 18-foot ladder reach?</u>
Round your answer to the nearest metre.

18 ft   10 ft   8 ft   y   x

x triangle: 10, 8, 18, + scale factor
x, + scale factor

Scale factor = $\frac{18}{10}$

$x = 8 \times 1.8$
$= 14.4$ ft.

$= 1.8$

$y = 14.4 - 8$
$= 6.4$
$= 6$ ft

18, 8, y, x, 8, 14.4

∴ The 18-ft ladder reaches 6ft

P2

Communication Corner
(leave blank)
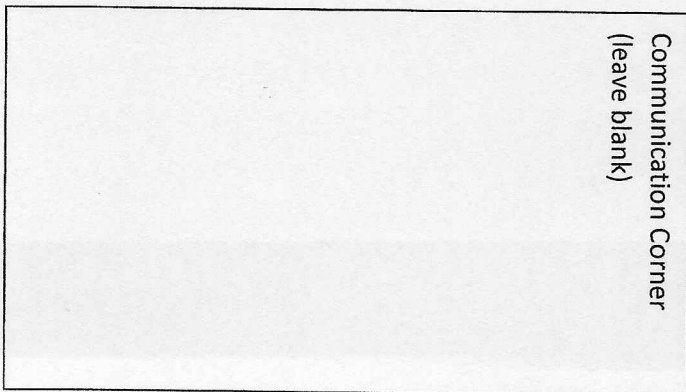
4. A student in your class states: "**You can use either the Pythagorean Theorem or similar triangles while working on this problem.**"

Do you agree with this statement? Provide support for your position (assume that the triangles in the diagram are similar).

PROBLEM

Calculate the length and width of the pond. Round your answers to the nearest metre.

AB = 14 m

AX = 28 m

BC = 11 m

LENGTH
Pond
WIDTH
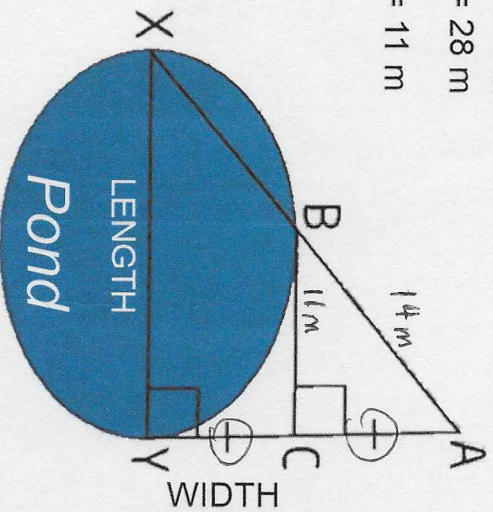
Communication Corner (leave blank)

Yes, I agree with the statement. I can use the P. Theorem to find the width.

$$AC^2 = 14^2 - 11^2$$
$$= 196 - 121$$
$$= 75$$
$$AC = \sqrt{75}$$
$$\doteq 8.7$$

Since $AC = CY$, width of the pond is about 8.7 m. To the nearest metre, 9 m.

I can use similar triangles too. Since AY is twice AC and AX is also twice AB, the scale factor is 2.

∴ Length = XY = 2 × 11 m
= 22 m