Questions on 6.5 HW?

Find the missing side in each right triangle. Triangles are not drawn to scale. $a^2 + b^2 = c^2$
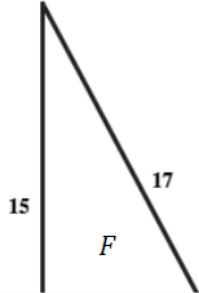
1.

C
3   A
4

2.

c
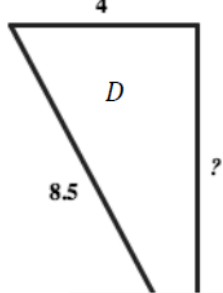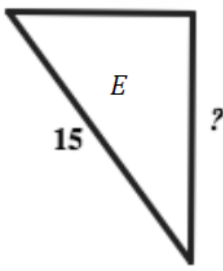6.5   B   2.5
a

$25^2 + b^2 = 6.5^2$ $?b$
$6.25 + b^2 = 42.25$
-6.25 -6.25
$\sqrt{b^2} = \sqrt{36.0}$
$\boxed{b = 6}$

3.

10
C
24   ? c

4.

4
D
?
8.5

5.

E
15   ?

6.

15   17
F

In each of the diagrams use the given information provided to find the missing lengths and angle measurements.

8. Line $m\|n$ and $o\|p$, find the values of angles x, y and z. Also, find the lengths of a, b and c.

$z = 40°$

$y = 60°$

$x = 60°$

$a = 12$

$b = 6$

$c = 12$

$$\frac{9}{a} = \frac{15}{20}$$

$$9 \cdot 20 = 15a$$

$$\frac{180}{15} = \frac{15a}{15}$$

$$12 = a$$

m   20

$z°$ 40

$b = 6$

$x°= 60$

6

n 40 $a = 12$

$y° = 60$

40°   4

9

80°

$$\frac{12}{9} = \frac{16}{c}$$

$$\frac{144}{12} = \frac{12c}{12}$$

$$12 = c$$

9. Line $q \| r \| s$ and $t \| u$ and $p \| w \| v$, find the values of angles x, y and z. Also, find the lengths of a, b, c, d, e, f.

13.

$$\frac{1}{2}x - 7 = \frac{3}{4}x - 8$$

14.

$$17 + 3(x - 5) = 2(x + 3)$$

15.

$$\frac{x+5}{6} = \frac{3(x+2)}{9}$$

$$9(x+5) = 6(3(x+2))$$
$$9x + 45 = 6(3x + 6)$$
$$9x + 45 = 18x + 36$$
$$-9x \qquad -9x$$
$$45 = 9x + 36$$
$$-36 \qquad -36$$
$$\frac{9}{9} = \frac{9x}{9}$$
$$1 = x$$

16.

$$x + 2 + 3x - 8 = 90$$

17.

$$\frac{5}{12} = \frac{x}{8}$$

18.

$$\frac{4}{5} = \frac{x+2}{15}$$

13.

$$4\left(\frac{1}{2}x - 7 = \frac{3}{4}x - 8\right)4$$

$$2x - 28 = 3x - 32$$
$$-2x \quad\quad -2x$$
$$-28 = x - 32$$
$$+32 \quad\quad +32$$
$$4 = x$$

14.

$$17 + 3(x - 5) = 2(x + 3)$$

15.

$$\frac{x + 5}{6} = \frac{3(x + 2)}{9}$$

$$9(x+5) = 6(3(x+2))$$
$$9x + 45 = 6(3x + 6)$$
$$9x + 45 = 18x + 36$$
$$-9x \quad\quad -9x$$
$$45 = 9x + 36$$
$$-36 \quad\quad -36$$
$$\frac{9}{9} = \frac{9x}{9}$$
$$1 = x$$

16.

$$x + 2 + 3x - 8 = 90$$

17.

$$\frac{5}{12} = \frac{x}{8}$$

18.

$$\frac{x + 2}{5} = \frac{x + 2}{15}$$

6.6 Yard Work in Segments
A Solidify Understanding Task

Malik's family has purchased a new house with an unfinished yard. They drew the following map of the back yard:
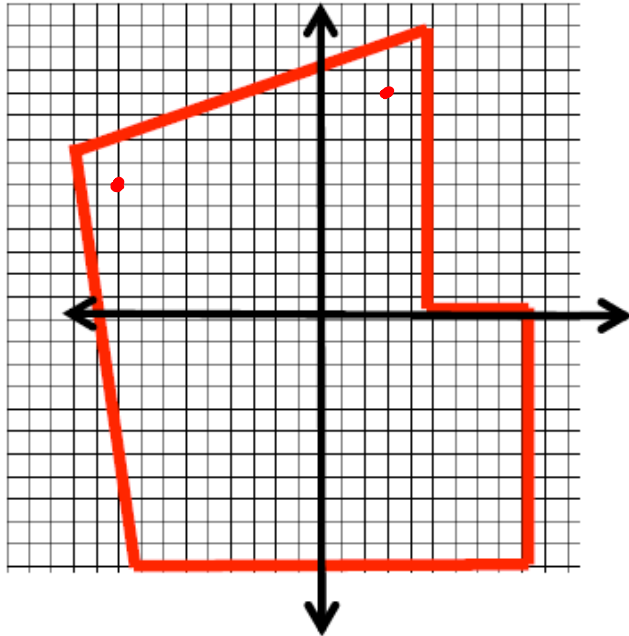
Malik and his family are using the map to set up gardens and patios for the yard. They plan to lay out the yard with stakes and strings so they know where to plant grass, flowers, or vegetables. They want to begin with a vegetable garden that will be parallel to the fence shown at the top of the map above.
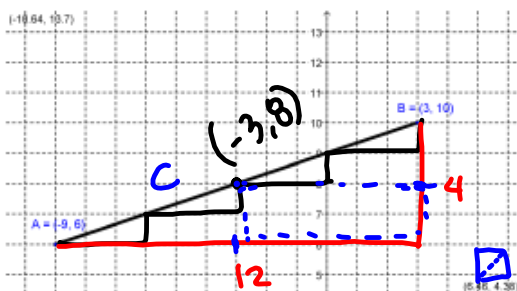
1. They set the first stake at (-9, 6) and the stake at the end of the garden at (3, 10). They want to mark the middle of the garden with another stake. Where should the stake that is the midpoint of the segment between the two end stakes be located? Use a diagram to describe your strategy for finding this point.

$$4^2 + 12^2 = c^2$$
$$16 + 144 = c^2$$
$$\sqrt{160} = \sqrt{c^2}$$
$$4\sqrt{10} = c$$

Feb 28-3:57 PM

2. Malik figured out the midpoint by saying, "It makes sense to me that the midpoint is going to be halfway over and halfway up, so I drew a right triangle and cut the horizontal side in half and the vertical side in half like this:"
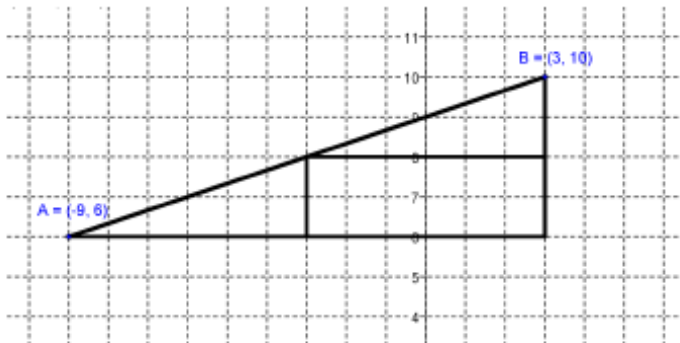

Malik continued, "That put me right at (-3, 8). The only thing that seems funny about that to me is that I know the base of the big triangle was 12 and the height of the triangle was 4, so I thought the midpoint might be (6, 2)."

Explain to Malik why the logic that made him think the midpoint was (6, 2) is almost right, and how to extend his thinking to use the coordinates of the endpoints to get the midpoint of ~~(6,2)~~ (-3, 8).

You go over 6 & up 2 from (-9, 6) to get to (-3, 8).

3. Malik's sister, Sapana, looked at his drawing and said, "Hey, I drew the same picture, but I noticed the two smaller triangles that were formed were congruent. Since I didn't know for sure what the midpoint was, I called it (x, y). Then I used that point to write an expression for the length of the sides of the small triangles. For instance, I figured that the base of the lower triangle was $-9 - x$."
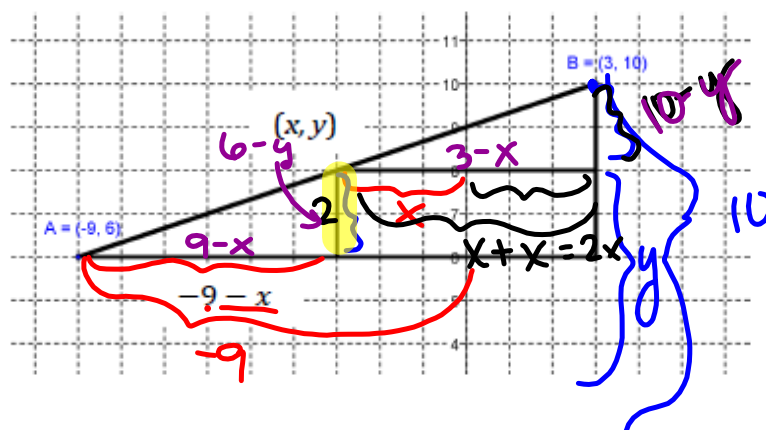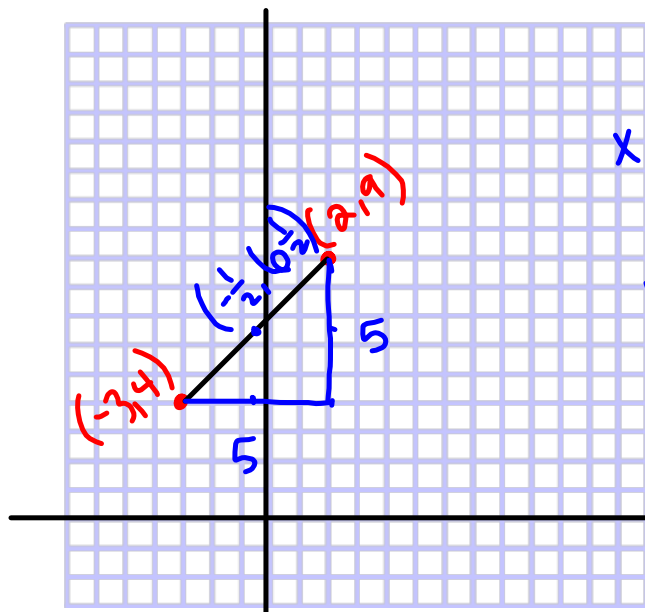

Label all of the other legs of the two smaller right triangles using Sapana's strategy.

Sapana continued, "Once I labeled the triangles, I wrote equations by making the bases equal and the heights equal."

Does Sapana's strategy work? Show why or why not.

4. Choose a strategy and use it to find the midpoint of the segment with endpoints (-3, 4) and (2, 9).

$$x = \frac{-3+2}{2} = -\frac{1}{2}$$

$$y = \frac{4+9}{2} = \frac{13}{2} = 6\frac{1}{2}$$

$$\left(-\frac{1}{2}, 6\frac{1}{2}\right)$$

(2,9)

$\left(-\frac{1}{2}, 6\frac{1}{2}\right)$

5

(-3,4)

5

5. Use either strategy to find the midpoint of the segment between (x_1, y_1) and (x_2, y_2).

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

midpoint formula

avg. of x-values

average of y-values

(x_2, y_2)

(x_1, y_1)

Feb 28-3:59 PM

6. The next area in the garden to be marked is for a flower garden. Malik's parents have the idea that part of the garden should contain a big rose bush and the rest of the garden ~~with~~ will have smaller flowers like petunias. They want the section with the other flowers to be twice as long as the section with the rose bush. The stake on the endpoints of this garden will be at (1, 5) and (4, 11). Malik's dad says, "We'll need a stake that marks the end of the rose garden." Help Malik and Sapana figure out where the stake will be located.
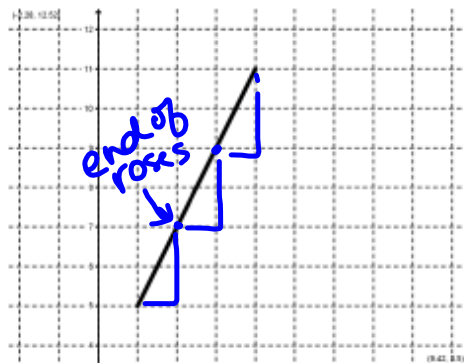
7. There's only one more set of stakes to put in. This time the endpoint stakes are at (-8, 5) and (2, -10). Another stake needs to be set that partitions the segment into two parts so that the ratio of the lengths is 2:3. Where must the stake be located?
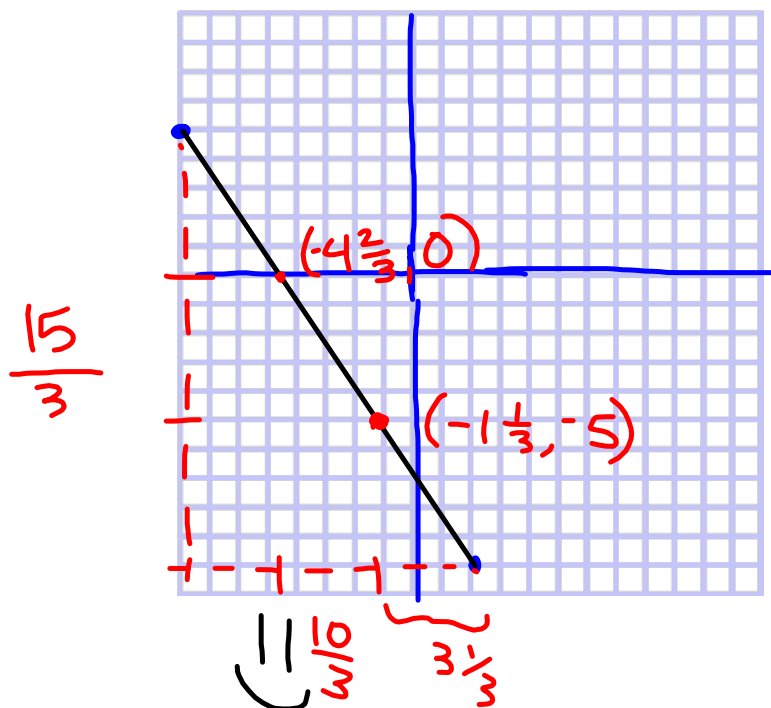
Homework

Finish 6.6 "Ready, Set, Go"

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