Warmup 3/(Pythagorean Triple 3, 4, __)

Created by Mr. Lischwe

1) Get out your notes sheet from yesterday and finish all the examples we didn't get to yesterday. Work in pairs or as a group if you like. On your warmup, you can just write "notes sheet".

ALEKS Progress Grade

+6% - 100

+5% - 90

+4% - 80

+3% - 70

SOME NOTES:

- The knowledge check can bump you up or down. If your progress was a lot higher or lower than you expected, this might be why.
- +2% 60
 +1% 50
 +0% 0
 Any ALEKS you complete between now and Friday can add to your progress grade.
 - It is about 4-5 topics for each percent.

Biggest Gainers:

<u>+7% Progress:</u> Kiley F Dylan P GiGi A Preston K Max R

<u>+8% Progress:</u> Hannah O Daniel D

<u>+10% Progress:</u> Jadyn G Zander K

QUIZ THURSDAY

- Pythagorean Theorem
- Finding the distance between two points
- Pythagorean Theorem Story Problems (drawing pictures & stuff)

Example 3

What is the distance between (-3, 2) and (4, 6)?
 Draw a picture to help!!!







 $20^{2} + 6^{2} = d^{2}$ 400 + 36 = d^{2} 436 = d^{2} d~ 20.9

Example 5

• Find the perimeter of the triangle.



purple: 13
green:
$$4^{2} + 12^{2} = x^{2}$$

 $16 + 144 = x^{2}$
 $160 = x^{2}$
 $160 = x^{2}$
 $12.6 \approx x$
blue: $9^{2} + 12^{2} = x^{2}$
 $(9,12,15) = Triple$
 $X = 15$
Perimeter = $13 + 12.6 + 15$
 $P \approx 40.$

p.435 (1-4, 9)

- 1) 3.6 units
- 2) 4.1 units
- 3) 7.2 units
- 4) About 5.1 miles
- b. Sample answer: Make a right triangle using points B and C, then use the Pythagorean Theorem.
 - C. $AC \approx 3.6$ units
 - AB = 5 units
 - $AC \approx 4.2 \text{ units}$
 - d. 12.8 units

Geography Application

35.2

3.3

11.89=d2

d≈3.448°

×60 miles per

dearee

- This mathematical concept is used to find the distance between cities.
- 86.8 Nashville has a latitude of about 36.2° N and a longitude of about 86.8° W. Memphis has a latitude of about 35.2°N and 90.1°W. Each degree of latitude or longitude is about 60 miles. Based on this information, how far apart are Nashville and $3.3^{2}+1^{2}=d^{2}$ Memphis?



Alternate Method: Distance Formula



- Write this in the blank space on the top right:
 IF YOU DON'T HAVE A GRAPH:
- Get the horizontal leg by subtracting the x-coordinates
- Get the vertical leg by subtracting the y-coordinates
- Then do $a^2 + b^2 = c^2$

$$a^2 + b^2 = c^2$$

When I'm finding the distance, which letter is that?

$$\sqrt{a^2+b^2}=c$$

If "a" is the horizontal distance and "b" is the vertical distance:

$$\sqrt{(x-x)^2 + (y-y)^2} = c$$

Distance Formula

If (x_1, y_1) and (x_2, y_2) are the points, then:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

• NOTE: If this formula confuses you, you don't have to use it (at least not this year). You can just draw the triangle and use $a^2 + b^2 = c^2!$

Application - Ladders

• A 15-foot ladder is propped up against a 15-foot building. When laid flat against the building, it looks



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 If the bottom of the ladder was moved OUT 4 feet, what would happen? How far below the top of the building would the ladder go?



Application: Ladders

- 1. A 15-foot ladder is propped up against a 15 foot-tall building. The bottom of the ladder is 4 feet from the building. How high up the building does the ladder reach? **Draw a picture and use it to solve!** 15/h $4^{2}+h^{2}=15^{2}$
- 2. If you want to position the ladder so that it will exactly reach a window whose windowsill is 2 feet from the top of the building, how far from the building would you have to position the bottom of the ladder? $x^{2}+13^{2}=15^{2}$
- 3. CHALLENGE/Early Finisher: How far away from the building does the bottom have to be so that the distance from the ladder to the building is the **same** as the distance from the ground up to the top of the ladder? (Also, does this seem safe?)

HOMEWORK: Story Problems Worksheet