## Warmup 3/(Number of ears in the Three Musketeers)

1)Find the area of this triangle: Created by Mr. Lischwe


2) What is the distance between the points $(2,8)$ and $(11,-5)$ ? Round your answer to the nearest tenth. (Draw a picture if it helps)

## QUIZ FRIDAY

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


## Example 5

## Geography Application

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


$$
\text { p. } 435(1-4,8,9)
$$

1) 3.6 units
2) 4.1 units
3) 7.2 units
4) About 5.1 miles
5) About 150 miles
6) b. Sample answer: Make a right triangle using points $B$ and $C$, then use the Pythagorean Theorem.
C. $A C \approx 3.6$ units
$A B=5$ units
$A C \approx 4.2$ units
d. 12.8 units

## Alternate Method: Distance Formula



- How do you get the length of the HORIZONTAL leg?
- Subtract the x-coordinates!
- How do you get the length of the VERTICAL leg?
- Subtract the $y$-coordinates!

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

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:

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

## Write it down on your notes page if you want...

Distance Formula
If $\left(x_{1}, y_{1}\right)$ and $\left(x_{2}, y_{2}\right)$ are the points, then:

$$
d=\sqrt{\left(x_{2}-x_{1}\right)^{2}+\left(y_{2}-y_{1}\right)^{2}}
$$

- 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 $a^{2}+b^{2}=c^{2}$ !


## Rest of today:

- Partner Problems
- Label a piece of paper "Partner Problems" - all your work goes on this page
- Keep your work organized; label each problem
- You may also use a graphing sheet if you want
- DO NOT WRITE ON THE PROBLEMS!!!
- Find the distance between:
$(2,10)$ and $(6,3)$
$d=\sqrt{\left(x_{2}-x_{1}\right)^{2}+\left(y_{2}-y_{1}\right)^{2}}$


## A

A white square with side length $x$ is inscribed in a black circle as shown.


The circle has a radius of 8 feet. Enter an approximate side length for $x$, in feet, to the nearest tenth of a foot.

## B

## Area of a Right Triangle

- A right triangle has one leg that measures 12 inches and a hypotenuse that measures 13 inches. What is the area of this triangle?
*** Draw a picture! It will help!!!***

Line segment $\overline{E C}$ is shown on a coordinate plane.

DO NOT
DRAW ON
THIS PAPER!!!


What is the approximate length, in units, of $\overline{E G}$ ?
A 5.1
( 7.2
c. 18.4

- 26.0


## E

To the nearest tenth of a unit, what is the perimeter of a triangle with vertices at $(3,4),(2,2)$, and ( 0,5 )?
A 5.3 units
B 7.3 units
c. 8.7 units

D 9.0 units
You should draw a picture to help you!!! (You may draw it or use a graphing sheet)

Enter the length, to the nearest hundredth of an inch, of the diagonal.

## More ladders!

- A 20 -foot ladder is leaning against a 24 foot tall building. How far away from the building must the ladder be so that it reaches a window that is 6 feet below the top of the building? (Draw a picture!)


## Find the distance between:

- Points $(101,450)$ and $(200,-50)$


## Bob's Drive

## H

- Bob drives 10 miles east, then 3 miles south, then 4 miles west. How far away from his starting point does he end up? (Draw a picture!)


## HOMEWORK:

- p. 427 (4, 5, 6, 10)

