Algebra 2 9.1

Find the midpoint of a segment on the coordinate plane

Find the distance between two points on the coordinate plane

coordinate plane

midpoint ½ in between average

pythagorean theorem P. T.

string

16 18

How can I find the place in the middle?

What is the name for something that is half-way in between?

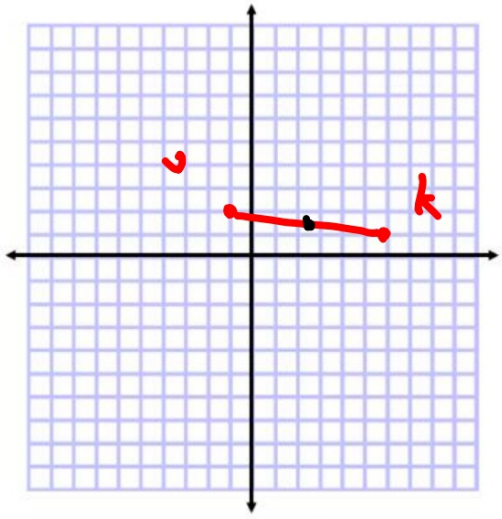
average
mean

Say your test scores are 88 and 82...

$$\frac{88+82}{2} = 85$$

Example 1 Find a Midpoint

Find the coordinates of M, the midpoint of $\overline{JK}$, for $J(-1, 2)$ and $K(6, 1)$.



$$\frac{-1+6}{2} \quad \frac{2+1}{2}$$

$$\left(\frac{5}{2}, \frac{3}{2}\right)$$

Whiteboards

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1A. Find the coordinates of the midpoint of $\overline{AB}$ for $A(5, 12)$ and $B(-4, 8)$.

$M\left(\frac{1}{2}, 10\right)$

P.T.
↓ Pythagorean theorem & distance

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

$(2,5)\ (-1,7)$

$2^2+3^2=d^2$

$4+9=d^2$

$\sqrt{13}=\sqrt{d^2}$

$d=\sqrt{13}$

$d\approx 3.6$

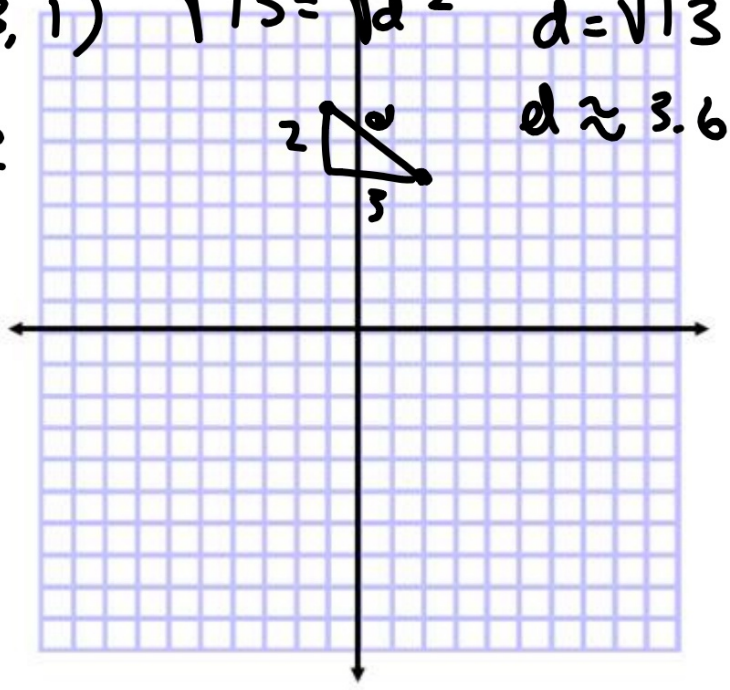
J ?(x,y)

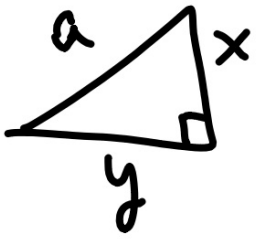
$(-3,1)$

$\frac{y+9}{2}=\frac{5}{1}$

$y+9=10$

$y=1$





Find the distance between A and B. Round to the nearest tenth.

A (2, 5) B (8, 12)

A (0, 7) B(-3, 2)

A (-5, -4) B (8, 20)

A (-3, -1) B (-5, -11)

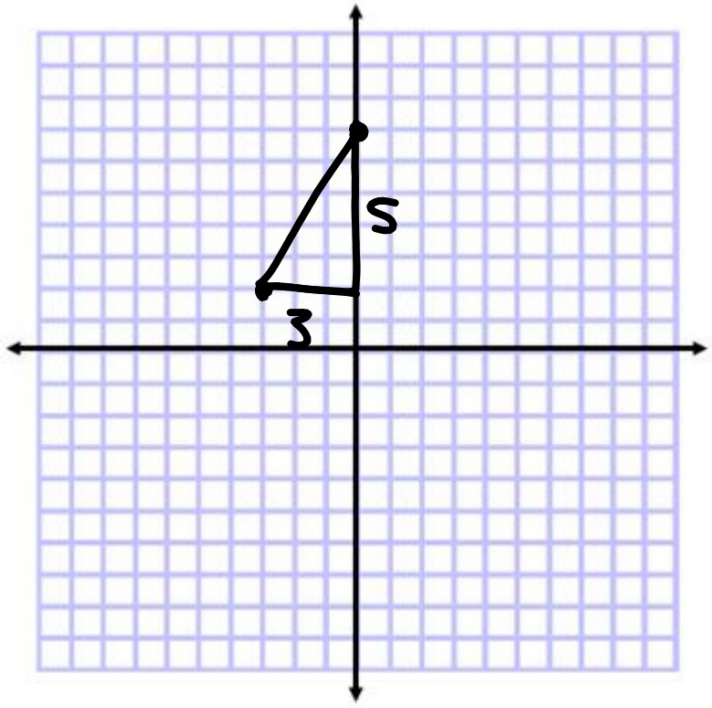
What do you notice?

$9+25$

$\sqrt{34}$

13^2+24^2

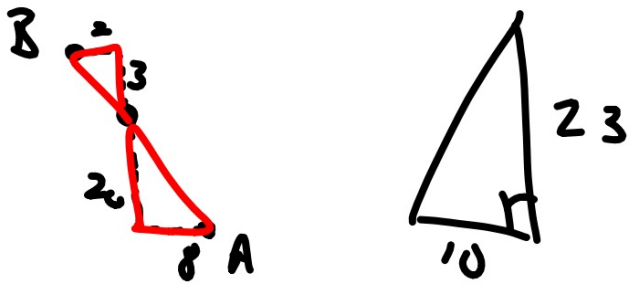
2^2+10^2



Frisbee golf

Real-World Example 2 Find the Distance Between Two Points

DISC GOLF Troy's disc is 20 feet short and 8 feet to the right of the basket. On his first putt, the disc lands 2 feet to the left and 3 feet beyond the basket. If the disc went in a straight line, how far did it go?



Birds-eye-view:
Put the hole at (0,0)

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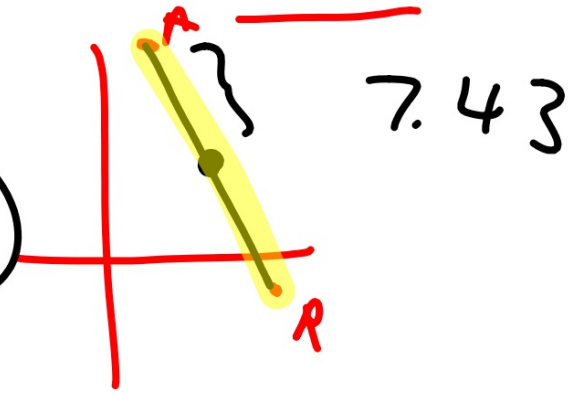
2. Sharon hits a golf ball 12 feet above the hole and 3 feet to the left. Her first putt traveled to 2 feet above the cup and 1 foot to the right. How far did the ball travel on her first putt?

Standardized Test Example 3 Find the Midpoint Between Coordinates

A coordinate grid is placed over a Florida map. St. Augustine is located at (3, 13), and Rockledge is located at (8, −1). If Port Orange is halfway between St. Augustine and Rockledge, which is closest to the distance in coordinate units from St. Augustine to Port Orange?

$5^2+14^2=$ 14.87



7.43

Do I have enough information?
What do I need to know?

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3. The coordinates for points A and B are $(-4, -5)$ and $(10, -7)$, respectively. Find the distance between the midpoint of $\overline{AB}$ and point B.

F $\sqrt{10}$ units **G** $5\sqrt{10}$ units **H** $\sqrt{50}$ units **J** $10\sqrt{5}$ units

Do I have enough information?
What do I need to know?

9.1 pr.

WB odds +32