Warm-up!!

1. What is the length of a segment whose endpoints are $(-2, 2)$ and $(6, 0)$?

A $2\sqrt{17}$

B $3\sqrt{6}$

C $3\sqrt{15}$

D $4\sqrt{5}$

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

2. What are the coordinates of the midpoint of a line segment with endpoints $(-3, 4)$ and $(7, 2)$?

A $(1, -1)$

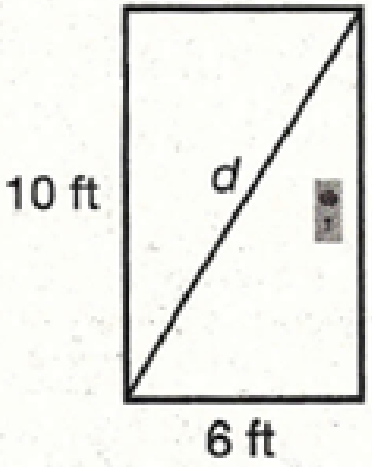
B $(2, 3)$

C $(2, 0)$

D $(3, 0)$

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

3. The diagram below shows the design for a barn door with a board on the diagonal for extra strength.



What is d, the length of the diagonal board, in feet (ft)?

A $2\sqrt{34}$

B $4\sqrt{17}$

C $8\sqrt{17}$

D 8

What is the length of a segment whose endpoints are $(-2, 2)$ and $(6, 0)$?

A $2\sqrt{17}$

B $3\sqrt{6}$

C $3\sqrt{15}$

D $4\sqrt{5}$

$x_1\ y_1 \qquad x_2\ y_2$

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

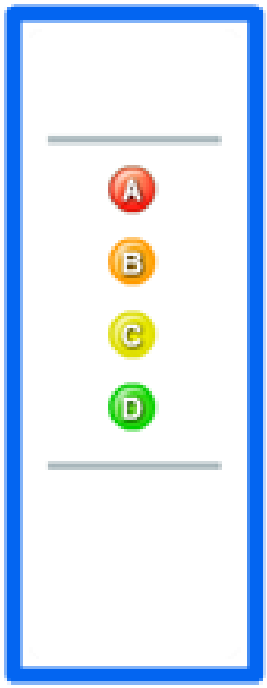
$$=\sqrt{(0-2)^2+(6+2)^2}$$

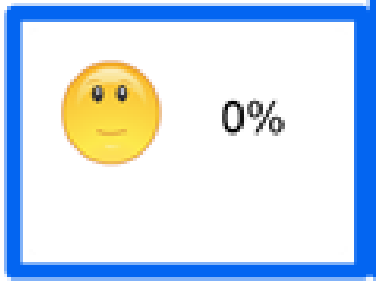
$$=\sqrt{(-2)^2+(8)^2}$$

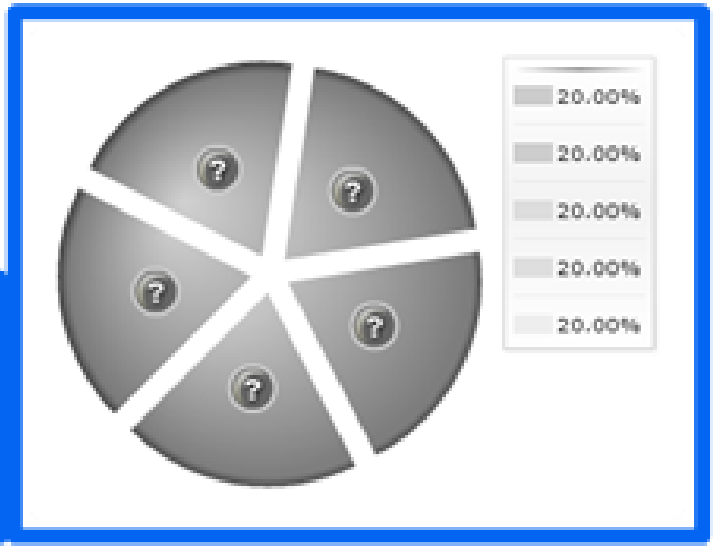
$$=\sqrt{4+64}$$

$$=\sqrt{68}$$

$$=8.24$$







What are the coordinates of the midpoint of a line segment with endpoints (−3, 4) and (7, 2)?

A (1, −1)

B (2, 3)

C (2, 0)

D (3, 0)

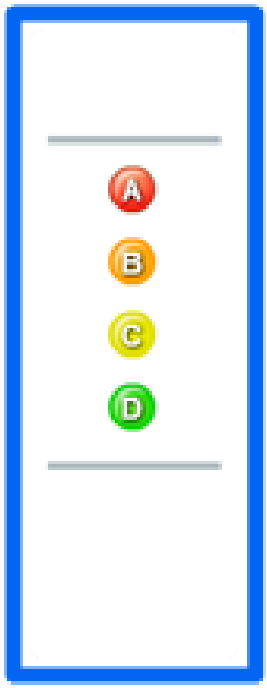
$$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$

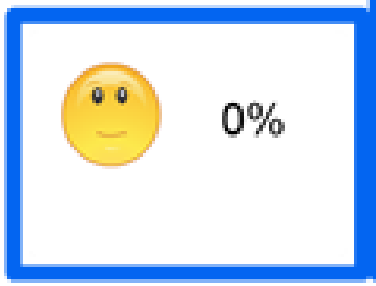
$$\left(\frac{-3+7}{2}, \frac{4+2}{2}\right)$$

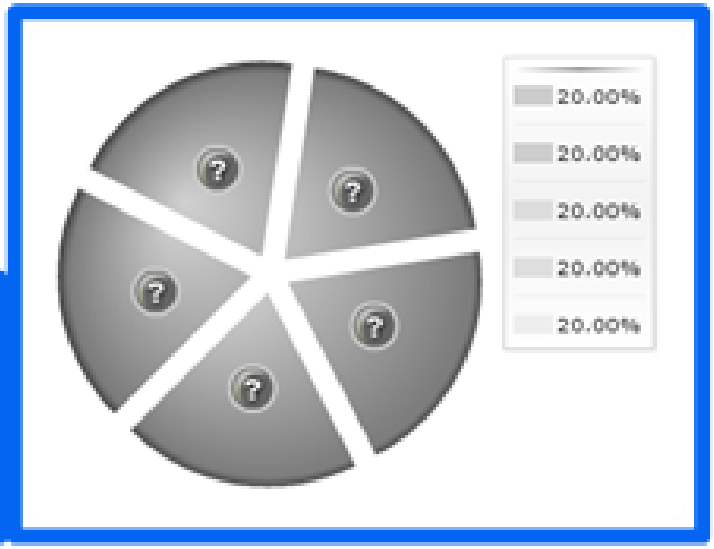
$$(2, 3)$$

-3 -2 -1 0 1 2 3 4 5 6 7

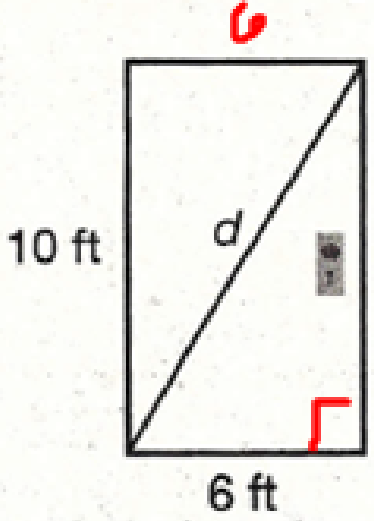
2 3 4







The diagram below shows the design for a barn door with a board on the diagonal for extra strength.



$10^2 + 6^2 = d^2$

$100 + 36 = d^2$

$\sqrt{136} = \sqrt{d^2}$

$11.67 = d$

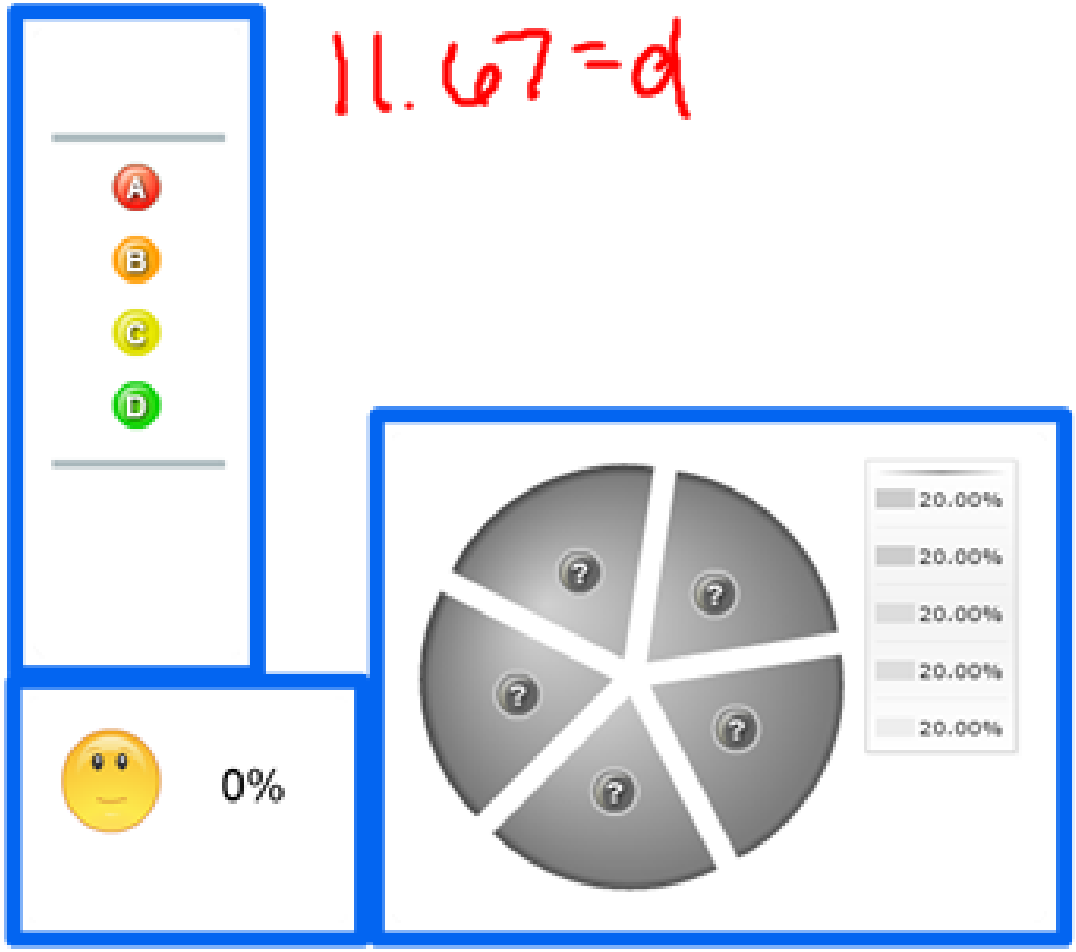
What is d, the length of the diagonal board, in feet (ft)?

A $2\sqrt{34}$

B $4\sqrt{17}$

C $8\sqrt{17}$

D 8



Dimensional Analysis

Goals aligned to the Common Core Standards:

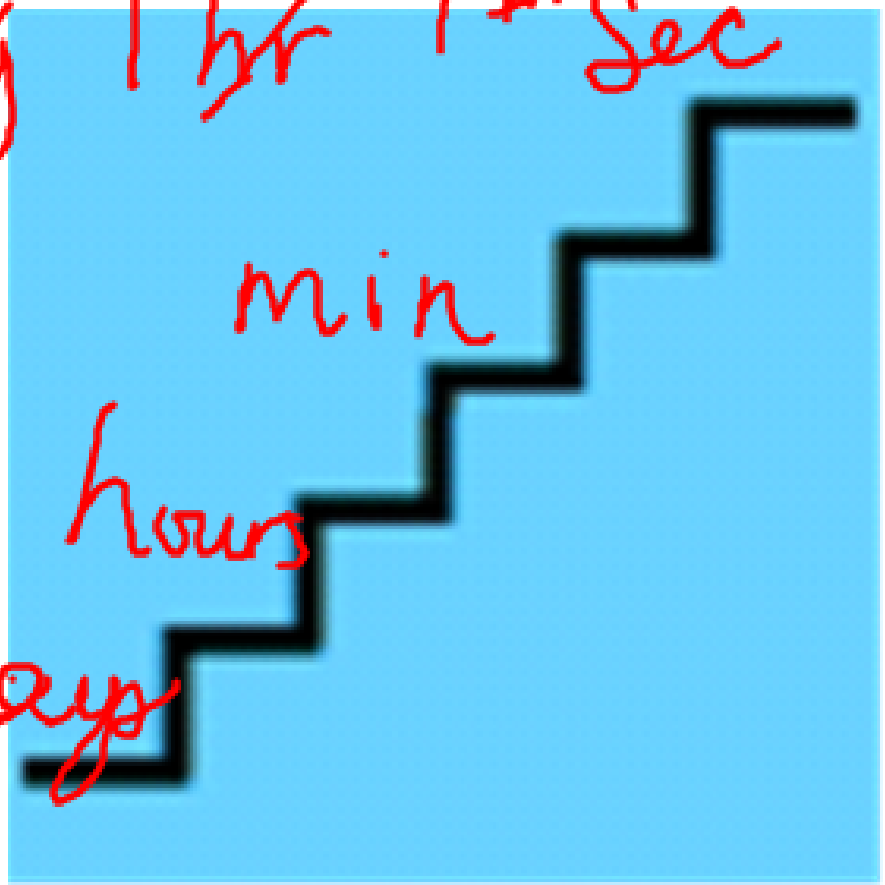
- You will understand and interpret units consistently.

Work in your groups to discuss:

How many seconds are in a day?

Steps to go from days to seconds:

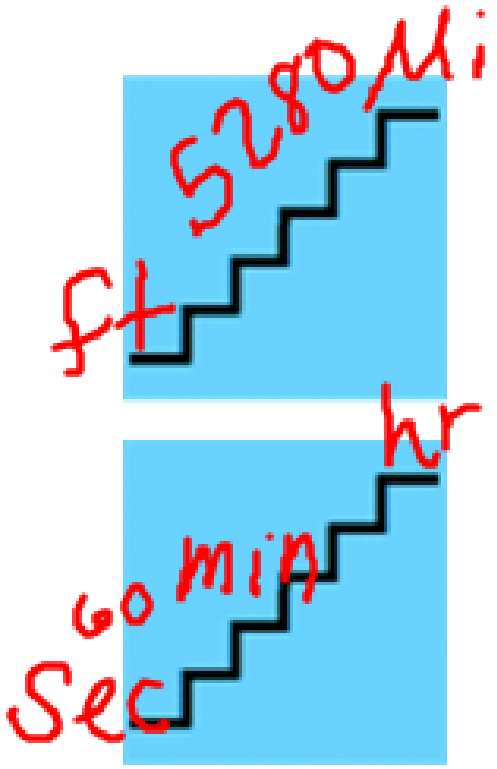
$$\frac{1\ day}{1} \cdot \frac{24\ hrs}{1\ day} \cdot \frac{60\ min}{1\ hr} \cdot \frac{60\ sec}{1\ min} =$$



86,400

Work in your groups to discuss:

How many minutes are in a year?



What is 116 feet in 9.6 seconds in miles per hour?

$$\frac{116\,ft}{9.6\,sec}\cdot\frac{1\,mi}{5280\,ft}\cdot\frac{60\,sec}{1\,min}\cdot\frac{60\,min}{1\,hr}=\frac{417{,}600\,mi}{50688\,hr}$$

$$\approx 8.24\ mi/hr$$

King Henry Doesn't Usually Drink Chocolate Milk

Kilo Hecto Deca Unit Deci Centi Milli

10 100 1000

1 1000g

1 100g

1 10g

$$\frac{261\,g}{1} \cdot \frac{1\,kg}{1000\,g} = \frac{261}{1000}\,kg$$

g → kg

.261 kg

Running

A 10K run is 10 kilometers long. If 1 meter = 1.094 yards, what is the length of the race in miles?

Speed

A car travels a distance of 100 feet in about 2.8 seconds. What is the speed of the car in miles per hour?

Shopping

Jamie found a rare video game on an online auction site priced at 35 Australian dollars. If the exchange rate is $1 US = $1.24 Australian, find the price of the game in US dollars.

$$\frac{35 \text{ AUS}}{1} \cdot \frac{\$1}{1.24 \text{ AUS}} = \$\frac{35}{1.24} = \$28.23$$

$ aus

Driving

Stacy drove from Greeneville To Fayetteville at an average rate of 55 miles per hour. What is Stacy's average rate in feet per minute?

Area

The area of a circle is 28.26 miles squared.
What is the area in inches squared?

$$\frac{28.26\ mi^2}{1} \cdot \frac{5280\ ft}{1\ mi} \cdot \frac{5280\ ft}{1\ mi} \cdot \frac{12\ in}{1\ ft} \cdot \frac{12\ in}{ft} =$$

1.89E10 → $1.134 \times 10^{11}\ in^2$

ft in

mi

1,890,000,000