

Good morning! Welcome back!

When the bell rings, we'll randomize,
do a 3-act task to round out our volume unit,
look over the benchmark, then start/continue circles!

What's the first question that comes to mind?

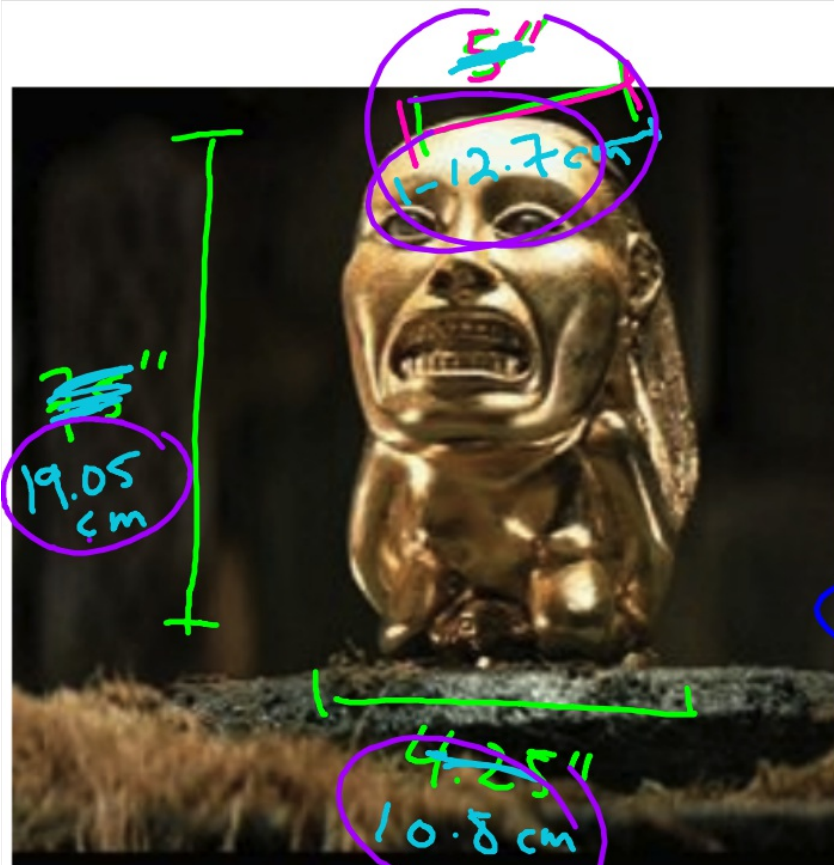
<https://youtu.be/aADExWV1bsM?t=56s>

What's the first question that comes to mind?



How much would a gold idol weigh? Could a grown person pick it up?





Important facts:

- Density of gold: 19.32 g/cm³ (at room temperature at sea level)

- Density of sand: varies, approximately 2.5 g/cm³

- Statue dimensions: about 7.5" tall, 4.25" wide, 5" deep

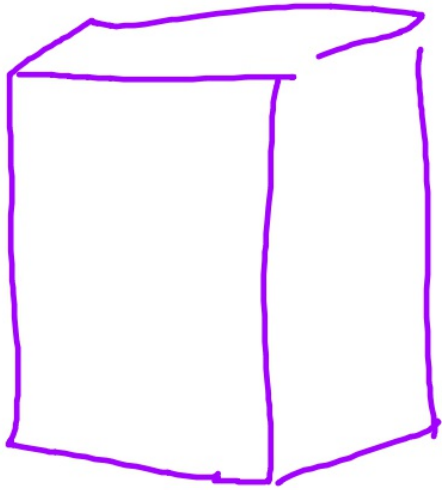
- 1 inch = 2.54 cm 1 lb ≈ 0.45kg

- A grown man can lift approximately 30-40 pounds in one hand (about 13.6 - 18.1kg)

Private think time

Interpret and Compare

(trade papers, read over their work, explain to them what you think they did)



$$\begin{aligned} V &\approx 2611 \text{ cm}^3 \\ &\times 19.32 \text{ g/cm}^3 \\ \hline &\approx 50,450 \text{ g} \end{aligned}$$

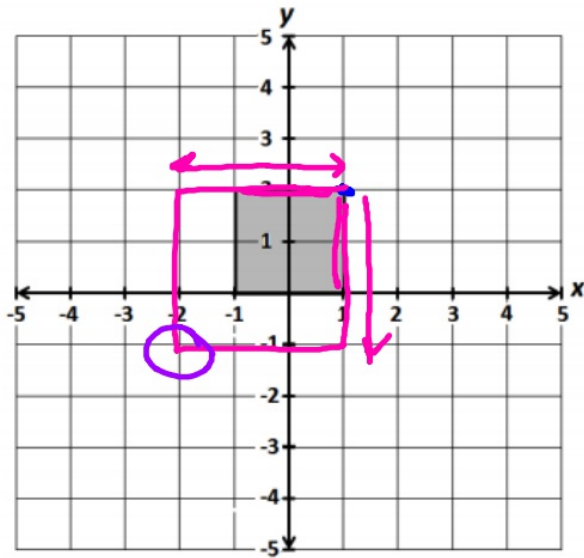
$$\begin{aligned} &\div 1000 \text{ g} \rightarrow \text{kg} \\ &\approx \underline{\underline{50.5 \text{ kg}}} \end{aligned}$$

$$116 = 0.45 \text{ kg}$$

$$\approx \underline{\underline{112 \text{ lbs}}}$$

Some benchmark questions:

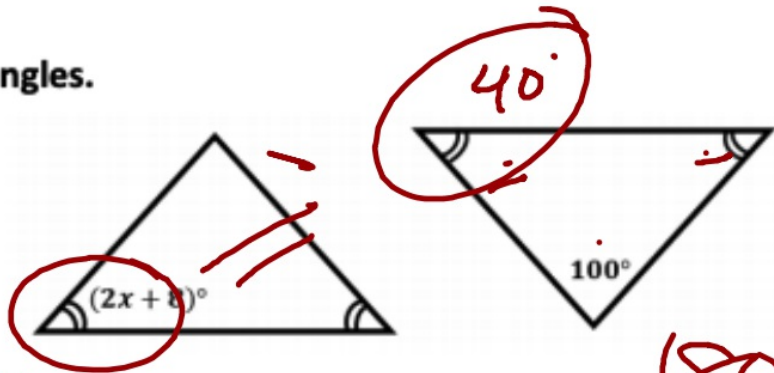
3. Consider the square.



If this square is dilated using a scale factor of 1.5, with the center of dilation at coordinate point $(1, 2)$, which is a coordinate of a corner of the dilated square?

- A $(0, 0)$
- B $(1, -1.5)$
- C $(-2, -1)$
- D $(-2.5, -2.5)$

4. Consider the two triangles.



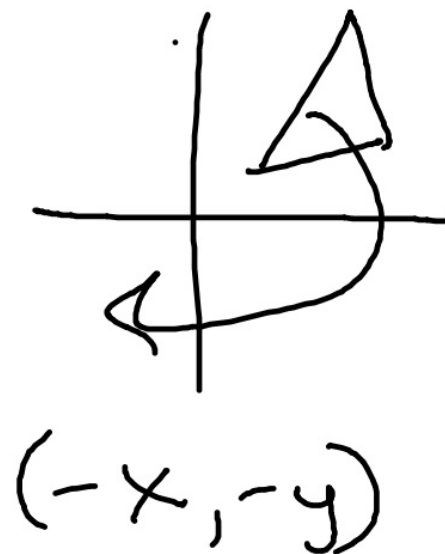
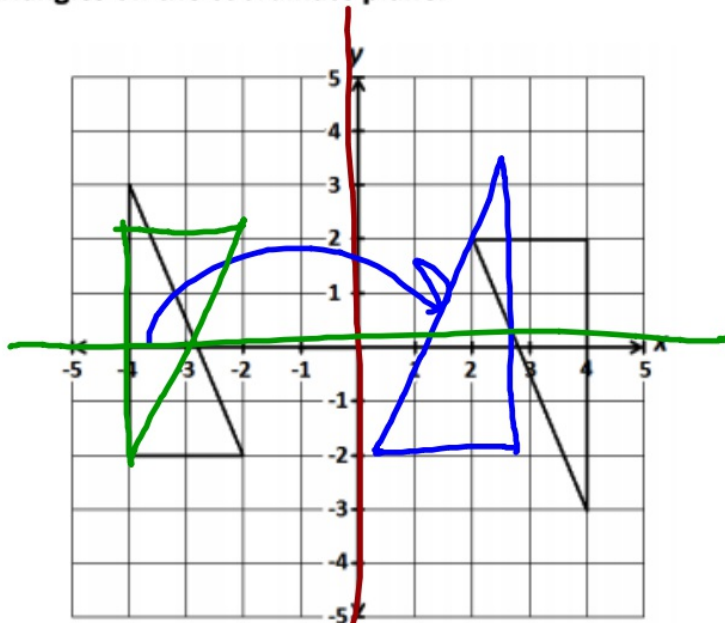
What is the value of x ?

- A 12
- B 16
- C 32
- D 36

$$\begin{array}{r} 180 \\ - 100 \\ \hline 80 \end{array}$$

$$2x + 8 + 2x + 8 + 100 = 180$$

8. Consider the two triangles on the coordinate plane.



Which rigid transformation(s) will carry one triangle onto the other? Select ALL that apply.

- A a horizontal translation
- B a reflection across the y -axis followed by a vertical translation
- C a reflection across the x -axis followed by a horizontal translation
- D a reflection across the x -axis followed by a reflection across the y -axis
- E a 180° clockwise rotation about the origin

18. Consider the equation.

$$2x + 4y = ~~12~~$$

Which two lines are parallel to the line represented by the equation?

A $y = -2x + 1$

B $y = -\frac{1}{2}x + 1$

C $y = 2x - 1$

D $2x + 4y = ~~12~~$

E $4x - 2y = 12$

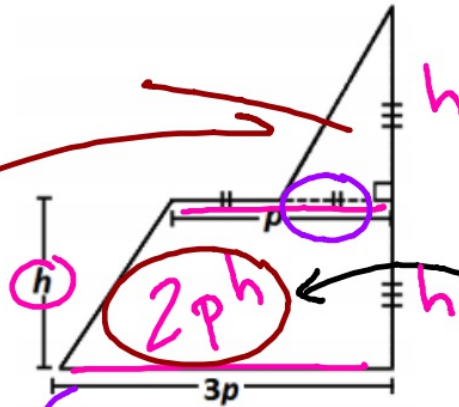
$4y = -2x + ~~12~~$
 $y = \boxed{-\frac{1}{2}}x + ~~\frac{3}{2}~~$

30. Consider the figure, which is not drawn to scale.

$$A_{\Delta} = \frac{1}{2}bh$$

$$\frac{1}{2}(\frac{1}{2}p)h$$

$$\frac{1}{4}ph$$



$$A_T = \left(\frac{b_1 + b_2}{2}\right) \cdot h$$

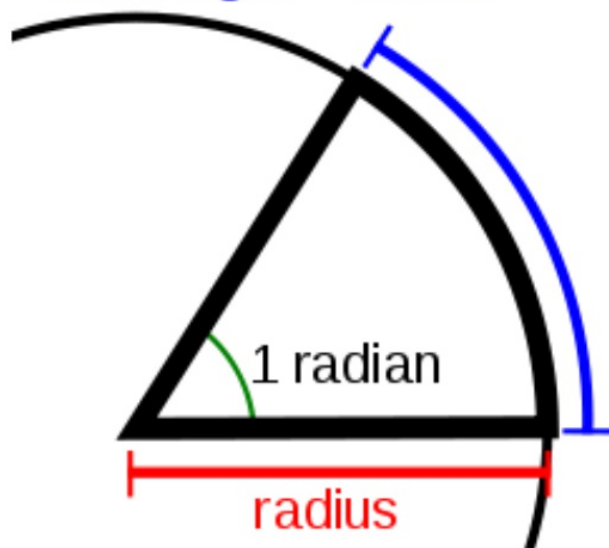
$$2p \cdot h$$

What is the area of the figure?

- A $\frac{ph}{4}$
- B $\frac{7ph}{2}$
- C $\frac{9ph}{4}$**
- D $3ph$

$$\frac{1}{4}ph + 2ph = \frac{9}{4}ph$$

arc length = radius

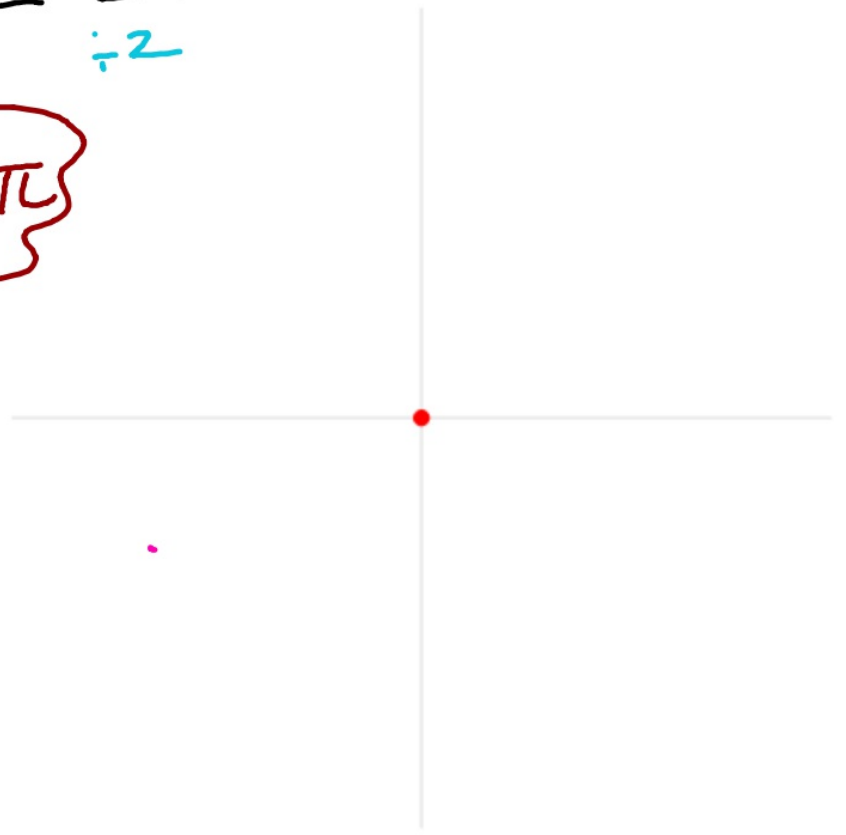


$$360^\circ = 2\pi$$

$\div 2$

$\div 2$

$$180^\circ = 1\pi$$



$$180^\circ = \pi \text{ radians}$$

Convert 30° to radians.

proportions

$$\frac{180^\circ}{\pi} = \frac{30^\circ}{x}$$

$$180x = 30\pi$$

$$x = \frac{1}{6}\pi$$

Convert $5\pi/6$ to degrees.

$$\frac{180^\circ}{\pi} = \frac{x}{5\pi/6}$$

$$x \cdot \pi = 150\pi$$

$$x = 150$$

$$180^\circ = 1\pi$$

Convert each to degrees or radians as appropriate.

$$2\pi/3$$

$$\frac{\cancel{2\pi}}{\cancel{3}} \times \frac{\pi}{\cancel{180}}$$

$$210^\circ$$

$$\frac{210^\circ}{x} \times \frac{180^\circ}{\pi}$$

$$\frac{210\pi}{180} = \frac{180x}{180}$$
$$\frac{7}{6}\pi = x$$

$$x \cdot \pi = 120\pi$$
$$x = 120^\circ$$

$$135^\circ$$

$$\frac{\text{deg}}{\text{rad}} \frac{135^\circ}{x} \times \frac{180^\circ}{\pi}$$

$$\frac{180x}{180} = \frac{135\pi}{180}$$

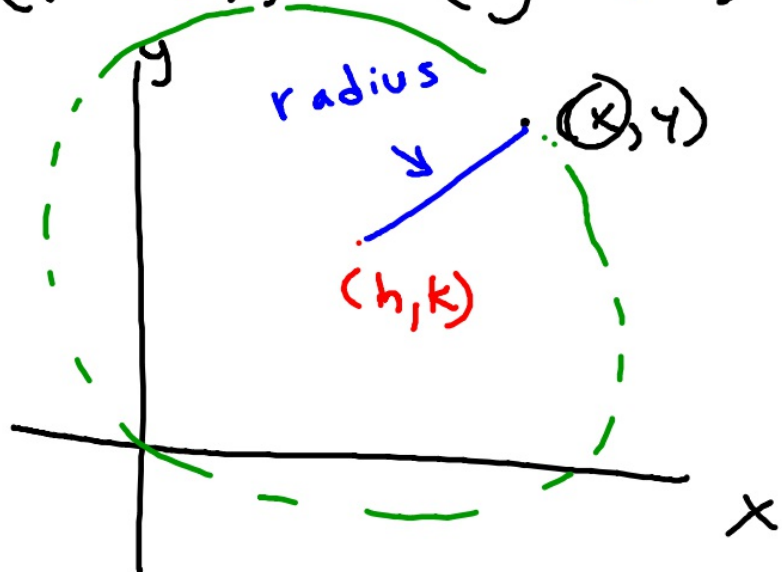
$$\pi/3$$

$$60^\circ$$

$$x = \frac{3}{4}\pi$$

Circles on the coordinate plane

$$(x-h)^2 + (y-k)^2 = r^2$$



(h, k)
center
of circle

r : radius
length

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

$$r = \sqrt{(x-h)^2 + (y-k)^2}$$

$$r^2 = (x-h)^2 + (y-k)^2$$

Write the equation of a circle with center $(3, -2)$ and radius 4 .

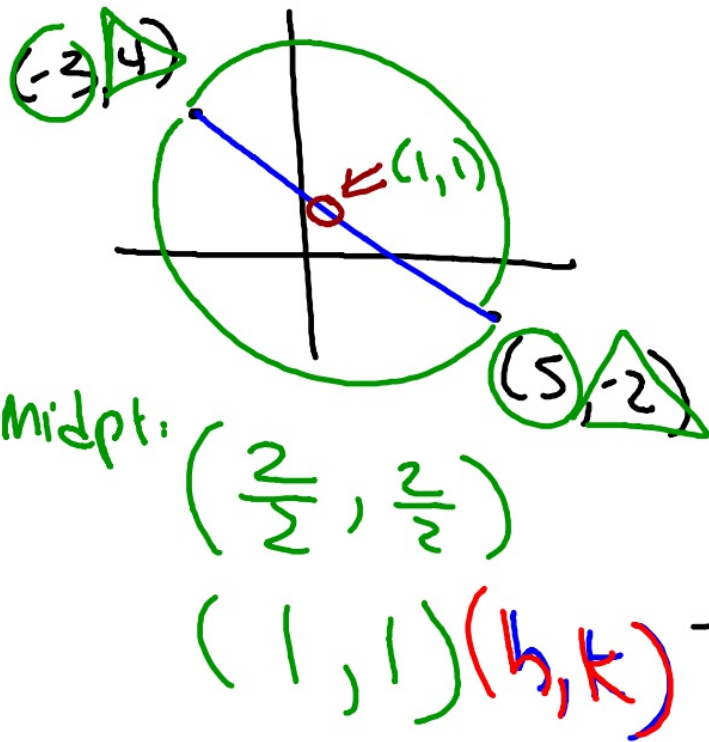
$$(x - \underline{3})^2 + (y + \underline{2})^2 = \underline{4^2} = 16$$

Identify the center and radius of $(x+2)^2+(y-5)^2=\cancel{36}$
 6^2

Center: $(-2, 5)$

radius: 6

Write the equation of the circle whose diameter has endpoints $(-3, 4)$ and $(5, -2)$.



$$(x - 1)^2 + (y - 1)^2 = 5^2$$

Plg in either given point into (x, y) .

$$(5 - 1)^2 + (-2 - 1)^2 = r^2$$

$$16 + 9 = r^2$$

$$25 = r^2$$

$$5 = r$$