

Name Ally

Your score _____ Percent _____ %

Unit 8 Study Guide #2
Common Core 7

Possible points _____ Grade _____

Show work on ALL problems

Standard 7.G.4

Know the formulas for the area and circumference of a circle and use them to solve problems
Give an informal derivation of the relationship between the circumference and area of a circle

Given the following formula, express π as a ratio:

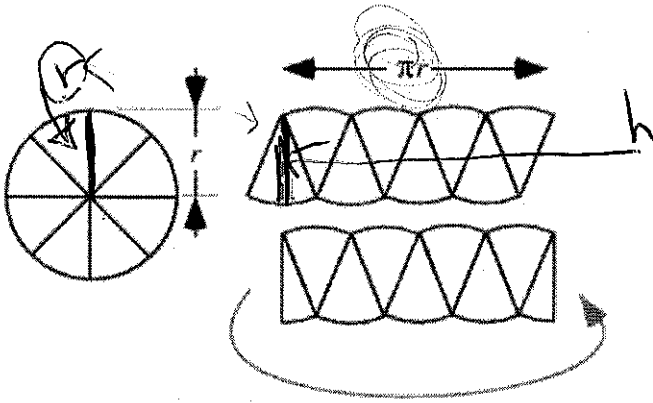
1. $C = \pi d$

$C = \pi \cdot d$
 $\frac{C}{d} = \pi$

inverse operations

The illustration below shows the relationship between the circumference and area. If a circle is cut into wedges and laid out as shown, a parallelogram results. Using this knowledge, describe how the formula for the area of a circle is developed.

2.



Prove:

$$A_{\square} = A_{\circ}$$

$$\downarrow$$

$$\textcircled{1} A_{\square} = b \cdot h$$

$$\textcircled{2} A = \pi r \cdot r$$

$$\textcircled{3} A_{\circ} = \pi r^2$$

units!!!!

Solve the following problems involving the area and circumference of circles. Use $\pi \approx 3.14$.

3. The 7th grade class is building a mini-golf game for the school carnival. The end of the putting green will be a circle. If the circle is 12 feet in diameter, how many square feet of grass carpet will they need to buy to cover the circle?

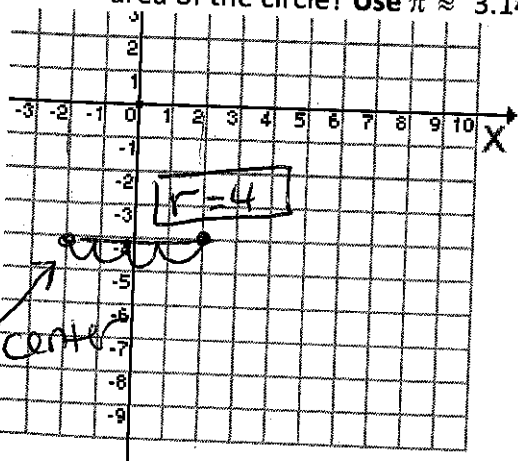
$$A = \pi r^2$$

$$A = 3.14 \times 6^2$$

$$A = 113.04 \text{ ft}^2$$

$r = 6$

4. The center of the circle is at (2, -4) and goes through the point (-2, -4). What is the area of the circle? Use $\pi \approx 3.14$.

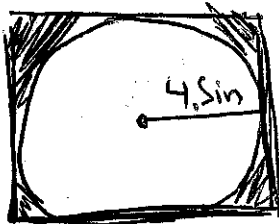


$$A = \pi r^2$$

$$A = 3.14 \times 4^2$$

$$A = 50.24 \text{ units}^2$$

5. A circle is cut from a square piece of plywood measuring 9 inches on each side. How much plywood would be left over after the circle is cut out? Use $\pi \approx 3.14$.



Goal:

$$A_{\text{leftover}} = A_{\square} - A_{\circ}$$

$$① A_{\square} = b \cdot h = 9 \cdot 9 = 81 \text{ in}^2$$

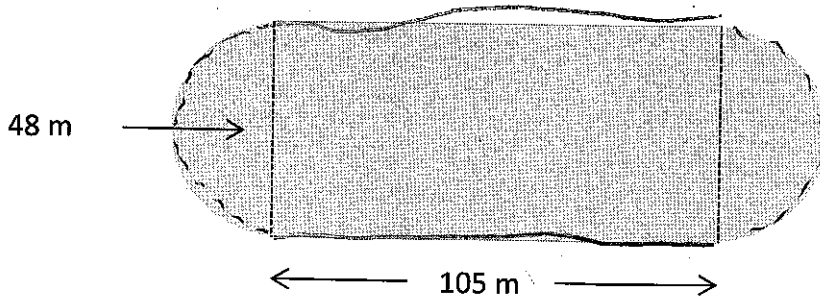
$$② A_{\circ} = \pi r^2$$

$$= 3.14 \times 4.5^2$$

$$= 63.59 \text{ in}^2$$

$$③ A_{\text{leftover}} = 81 - 63.59 = 17.41$$

6. What is the perimeter of the figure?



2 semicircles =
= 1 full circle

$$C = \pi d$$

① $P = \text{side} + \text{side} + \text{circumference}$

② $P = 105 + 105 + \pi d$

③ $P = 210 + 3.14 \times 48$

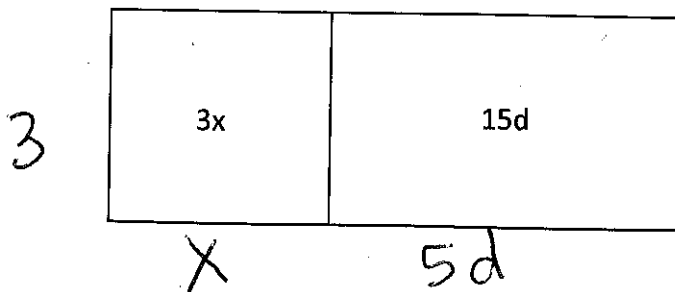
④ $P = 210 + 150.72$

⑤ $P = 360.72 \text{ m}$

Standard 7.EE.1

Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients

7. What is the length and width of the rectangle below?

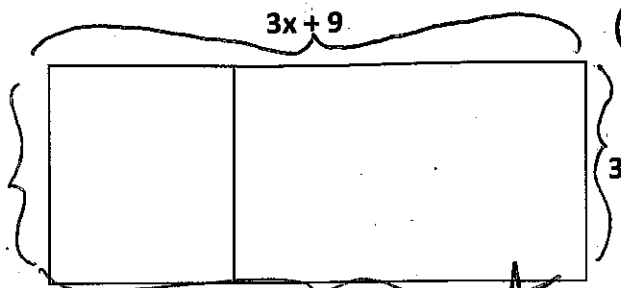


WORK:

$$\textcircled{3} \frac{3x + 15d}{(x + 5d)}$$

Length: $(x + 5d)$ units
Width: 3 units

8. Find the perimeter and area of the figure below.



$$\textcircled{1} P = L + L + W + W$$

$$P = (3x + 9) + (3x + 9) + 3 + 3$$

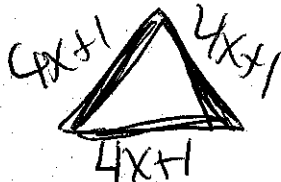
$$P = 6x + 18 + 6$$

$$P = (6x + 24) \text{ units}$$

$$\textcircled{2} A = L \cdot W$$

$$A = 3 \cdot (3x + 9) = 9x + 27 \text{ units}^2$$

10. An equilateral triangle has a perimeter of $12x + 3$. What is the length of each side of the triangle?



$$3 \overline{) 12x + 3}$$

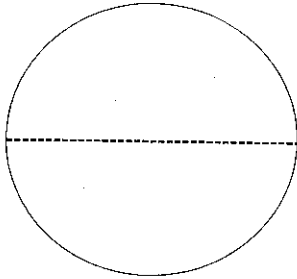
$$4x + 1$$

each side

units

11. What is the area of the circle? Use $\pi \approx 3.14$.

$$C = 10\pi$$



$$C = 2\pi r$$

$$\frac{10\pi = 2\pi r}{2\pi \quad 2\pi}$$

$$\boxed{5 = r}$$

units

$$A = \pi r^2$$

$$A = \pi \times 5^2$$

$$A = 25\pi$$

or

$$25 \times 3.14$$

$$\boxed{78.5}$$

units²

12. A circle has an area of 100π square miles. What is the circumference of the circle?
Use $\pi \approx 3.14$.

$$A = \pi r^2$$

$$\frac{100\pi = \pi r^2}{\pi \quad \pi}$$

$$\sqrt{100} = \sqrt{r^2}$$

$$\boxed{10 = r}$$

miles

$$C = 2\pi r$$

$$C = 2 \times 3.14 \times 10$$

$$C = 6.28 \times 10$$

$$\boxed{C = 62.8}$$

miles