

Name \_\_\_\_\_

Key

Your score \_\_\_\_\_

17 pts

Percent \_\_\_\_\_

**Chapter 8 Pre-Test (Part 2)**

**Common Core 7**

Possible points \_\_\_\_\_

17 pts

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  $\pi$  as a ratio:

1.  $C = \pi d$

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

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

Inverse operations!

1 pt

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.

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

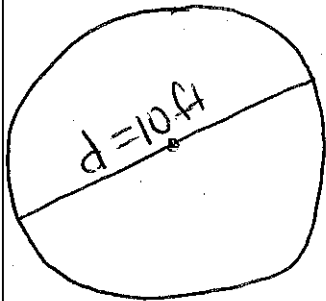
$$A = \pi r \cdot r$$

$$\boxed{A = \pi r^2} \star$$

1 pt

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

3. The 7<sup>th</sup> 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 10 feet in diameter, how many square feet of grass carpet will they need to buy to cover the circle?



$$A = \pi r^2$$

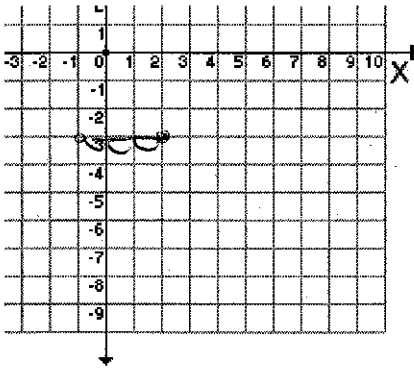
$$A = 3.14 \cdot 5^2$$

$$A = 78.5 \text{ ft}^2$$

$$\begin{array}{l} d = 10 \\ \boxed{r = 5} \end{array} \begin{array}{l} \downarrow \\ \text{use} \\ \text{this} \end{array}$$

1 pt

4. The center of the circle is at (2, -3) and goes through the point (-1, -3). What is the area of the circle? Use  $\pi \approx 3.14$ .



$$\boxed{r = 3}$$

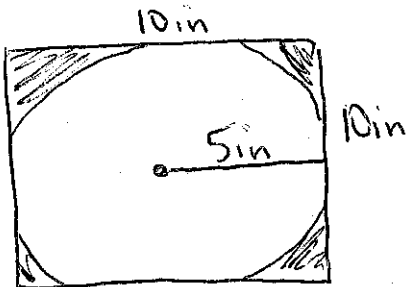
$$A = \pi r^2$$

$$A = 3.14 \cdot 3^2$$

$$A = 28.26 \text{ units}^2$$

1 pt

5. A circle is cut from a square piece of plywood measuring 10 inches on each side. How much plywood would be left over after the circle is cut out? Use  $\pi \approx 3.14$ .



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

$$A_{\text{leftover plywood}} = b \cdot h - \pi r^2$$

$$A = (10 \cdot 10) - (3.14 \cdot 5^2)$$

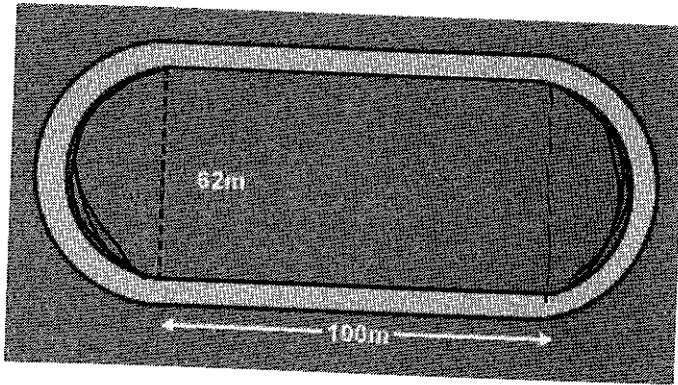
$$A = 100 - 78.5$$

$$\boxed{A = 21.5 \text{ in}^2}$$

1 pt

There are  $21.5 \text{ in}^2$  of plywood left over

6. What is the perimeter of the inside of the track?



note to self:  
 2 semicircles =  
 = 1 Full circle  
 so:  $C = \pi d$

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

$P = 100 + 100 + \pi d$

$P = 200 + 3.14 \cdot 62$

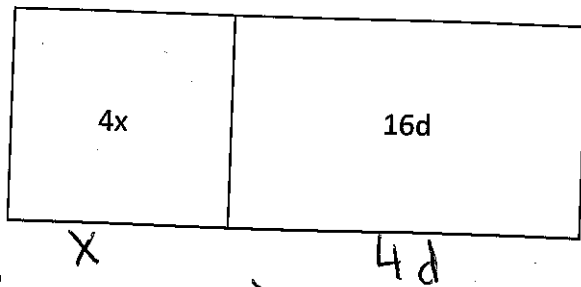
$P = 394.68 \text{ meters}$

1pt

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?



Step 3:

Final answer

Length = 4  
 width =  $(x + 4d)$

Step 1: slide method!

Work:  $2 \mid 4x + 16d$

$2 \mid 2x + 8d$

$2 \cdot 2 = 4$  (Length)

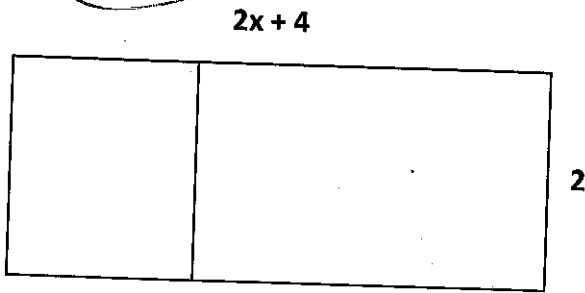
$x + 4d$  ← width of  $\square$   
 ↑ width of small  $\square$

1-1-w

Step 2:

2 pts

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



$$P: L + L + W + W$$

$$P = (2x + 4) + (2x + 4) + 2 + 2$$

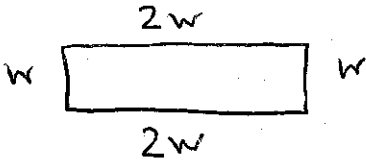
$$P = 4x + 8 + 4 =$$

$$P = (4x + 12) \text{ units}$$

$$A = L \cdot W$$

$$A = 2 \cdot (2x + 4) = 4x + 8 \text{ units}^2$$

9. A rectangle is twice as long as its width. One way to write an expression to find the perimeter would be  $w + w + 2w + 2w$ . Write the expression in two other ways.



Let width =  $w$

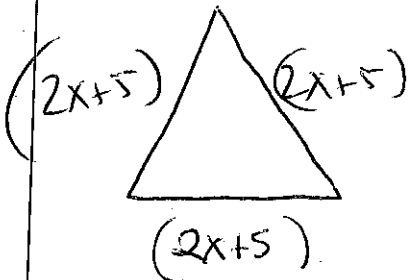
Let length =  $2w$

2nd way:

1st way:  $2(w + 2w)$  or  $2w + 4w$

2 pts

10. An equilateral triangle has a perimeter of  $6x + 15$ . What is the length of each side of the triangle?



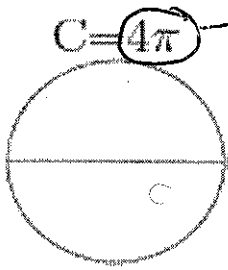
$$3 \overline{) 6x + 15}$$

$$\underline{2x + 5}$$

→ each side

1 pt

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



Step 1:  
 $C = \pi \cdot d$

$$\frac{4\pi}{\pi} = \frac{\pi d}{\pi}$$

$$4 \text{ units} = d$$

$$2 \text{ units} = r$$

Step 2:  
 $A = \pi \cdot r^2$   
 $A = 3.14 \cdot 2^2$   
 $A = 3.14 \cdot 4$

$$A = 12.56 \text{ units}^2$$

Final  $\nearrow$

2 pts

12. A circle has an area of 75.36 square miles. What is the circumference of the circle?  
 Use  $\pi \approx 3.14$ .

Step 1:  
 $A = 75.36 \text{ mi}^2$

$$A = \pi r^2$$

$$75.36 = \pi r^2$$

$$\frac{75.36}{3.14} = \frac{3.14 \cdot r^2}{3.14}$$

Step 2:

$$C = \pi \cdot d$$

$$C = 3.14 \cdot 9.80$$

$$C = 30.77 \text{ miles}$$

Final  $\nearrow$

2 pts

$$\sqrt{24} = \sqrt{r^2}$$

$$4.90 = r$$

miles

$$\downarrow \text{ so } d = 4.90 \cdot 2 = 9.80$$