

Bell Work pg. 881

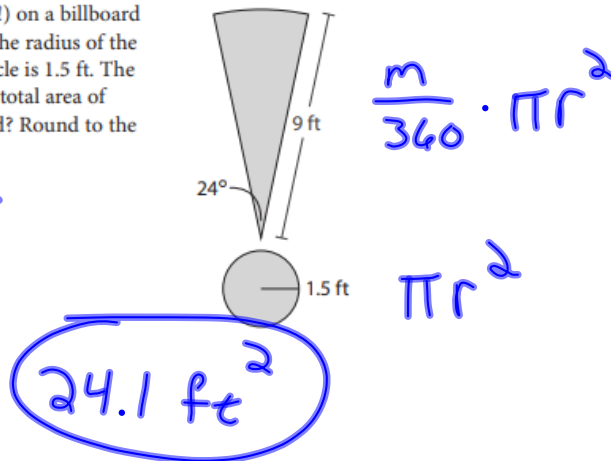
- 28. Multi-Step** The exclamation point (!) on a billboard consists of a circle sector and circle. The radius of the sector is 9 ft, and the radius of the circle is 1.5 ft. The angle of the sector is 24° . What is the total area of the exclamation point on the billboard? Round to the nearest tenth.

$$S = \frac{24}{360} \cdot \pi (9)^2$$

$$S = 17.0$$

$$C = \pi (1.5)^2$$

$$C = 7.1$$



17.1 Equation of a Circle

How can you write the equation of a circle if you know its radius and the coordinates of its center?

Equation of a Circle

The equation of a circle with center (h, k) and radius r is $(x - h)^2 + (y - k)^2 = r^2$.

Write the equation of the circle with center $(-2, 5)$ and radius of 3.

(h, k)

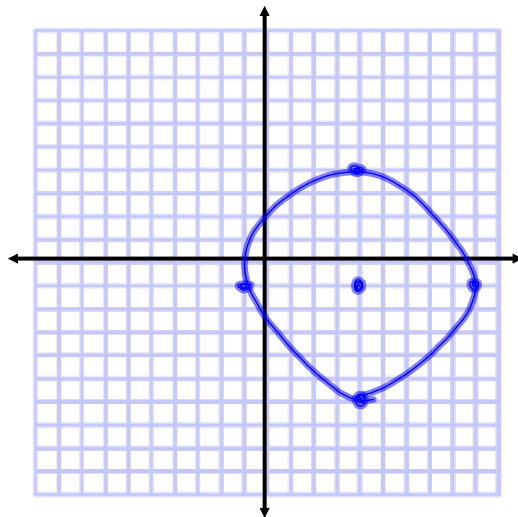
$$(x - h)^2 + (y - k)^2 = r^2$$

$$(x - (-2))^2 + (y - (5))^2 = (3)^2$$

$$(x + 2)^2 + (y - 5)^2 = 9$$

Write the equation of the circle with center (4,-1) and radius of 5.

$$(x-h)^2 + (y-k)^2 = r^2$$
$$(x-(4))^2 + (y-(-1))^2 = (5)^2$$
$$(x-4)^2 + (y+1)^2 = 25$$



Example 3 Prove or disprove that the given point lies on the given circle.

(A) [Point $(3, \sqrt{7})$] circle centered at the origin and containing the point $(-4, 0)$
 x, y

$$(0, 0) \quad r = 4$$
$$(x-h)^2 + (y-k)^2 = r^2$$
$$(x-0)^2 + (y-0)^2 = (4)^2$$
$$x^2 + y^2 = 16$$
$$(3)^2 + (\sqrt{7})^2 \stackrel{?}{=} 16$$
$$9 + 7 \stackrel{?}{=} 16$$
$$16 = 16, \text{ Yes}$$

Where does the point lie?

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

= r^2 - on circle

> r^2 - outside circle

< r^2 - inside circle

Prove or disprove that the given point lies on the given circle.

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12. Point $(\sqrt{18}, -4)$, circle centered at the origin and containing the point $(6, 0)$

$$(x-0)^2 + (y-0)^2 = 6^2 \quad (0,0) \quad r=6$$

$$x^2 + y^2 = 36$$

$$(\sqrt{18})^2 + (-4)^2 = 36$$

$$18 + 16 = 34$$

$34 < 36$, inside

13. Point $(4, -4)$, circle with center $(1, 0)$ and containing the point $(1, 5)$

$$(x-(1))^2 + (y-(0))^2 = 5^2 \quad r=5$$

$$(x-1)^2 + y^2 = 25$$

$$(4-1)^2 + (-4)^2 = 25$$

$$9 + 16 = 25$$

$25 = 25$, on

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2-5, 10-11, 15-16

Formulas To Know For Unit 6 Test

*Equation of a circle
 $(x-h)^2 + (y-k)^2 = r^2$

*Circumference and area of a circle

$$C = 2\pi r$$

$$A = \pi r^2$$

*Arc length:

$$S = \frac{m}{360} \cdot 2\pi r$$

*Area of a sector
 $A = \frac{m}{360} \cdot \pi r^2$

*Vertex lies inside circle



$$\text{Angle} = \frac{1}{2}(\text{arc} + \text{arc})$$

*Vertex lies outside circle



$$\text{Angle} = \frac{1}{2}(\text{Big arc} - \text{little arc})$$

Answers To Review

① $x=4$
 45°

② $m\angle ABC=90^\circ$
 $m\angle BCD=60^\circ$
 $m\angle DAB=120^\circ$

③ $(2, 0)$

④ $(x-4)^2 + (y+3)^2 = 1$

⑤ $C=10\pi$

⑥ $A=36\pi$

⑦ $\widehat{AB}=10\pi$
 $\frac{2\pi}{3}$

⑧ $\frac{125\pi}{36}$

⑨ $(2, 3)$
 3
NO

⑩ 69.5°

⑪ 30°