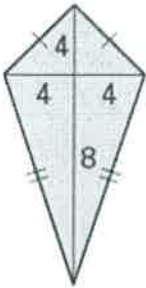
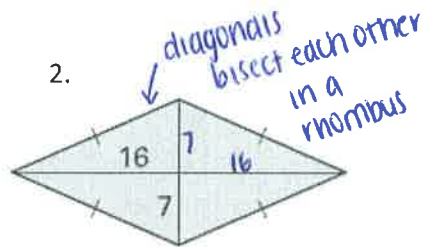


Find the area

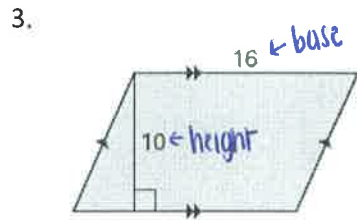
$d_1 = 4 + 4 = 8$
 $d_2 = 4 + 8 = 12$



$A = \frac{1}{2} d_1 d_2$
 $= \frac{1}{2} (8)(12)$
 $= 48 \text{ units}^2$

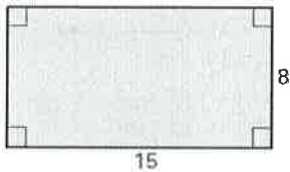


$d_1 = 16 + 16 = 32$
 $d_2 = 7 + 7 = 14$
 $A = \frac{1}{2} d_1 d_2$
 $= \frac{1}{2} (32)(14)$
 $= 224 \text{ units}^2$



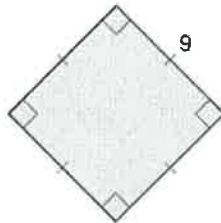
$A = bh$
 $= (16)(10)$
 $= 160 \text{ units}^2$

4.



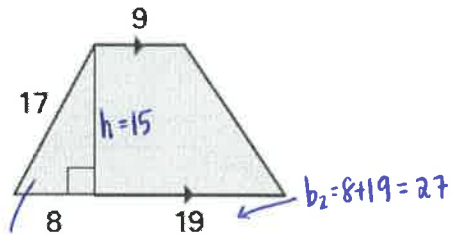
$A = bh$
 $= (15)(8)$
 $= 120 \text{ units}^2$

5.



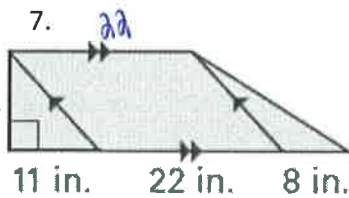
$A = s^2$
 $= (9)^2$
 $= 81 \text{ units}^2$

6.



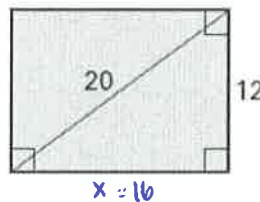
$8^2 + h^2 = 17^2$
 $64 + h^2 = 289$
 $h^2 = 225$
 $h = 15$
 $A = \frac{1}{2} (15)(9 + 27)$
 $A = \frac{1}{2} (15)(36)$
 $A = 270 \text{ units}^2$

7.



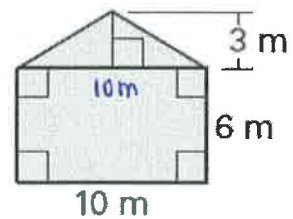
$b_2 = 11 + 22 + 8$
 $b_2 = 41$
 $A = \frac{1}{2} h (b_1 + b_2)$
 $A = \frac{1}{2} (12)(22 + 41)$
 $A = \frac{1}{2} (12)(63)$
 $A = 378 \text{ in}^2$

8.



$x^2 + 12^2 = 20^2$
 $x^2 + 144 = 400$
 $x^2 = 256$
 $x = 16$
 $A = bh$
 $A = (16)(12)$
 $A = 192 \text{ units}^2$

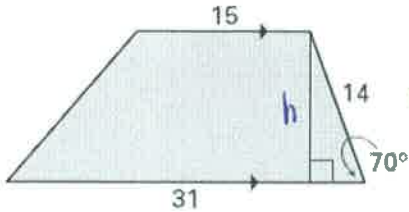
9.



A of Δ :
 $A = \frac{1}{2} (b)(h)$
 $A = \frac{1}{2} (10)(3)$
 $A = 15 \text{ m}^2$

A of \square :
 $A = bh$
 $A = (10)(6)$
 $A = 60 \text{ m}^2$
Total Area = $15 \text{ m}^2 + 60 \text{ m}^2 = 75 \text{ m}^2$

10.



$$\sin 70^\circ = \frac{h}{14}$$

$$h = 14 \sin 70^\circ$$

$$h \approx 13.2$$

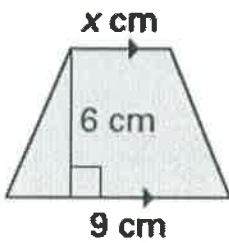
$$A = \frac{1}{2}h(b_1 + b_2)$$

$$A = \frac{1}{2}h(15 + 31) \leftarrow \text{need to find } h \text{ first}$$

$$A = \frac{1}{2}(13.2)(46) \Rightarrow \boxed{A \approx 303.6 \text{ units}^2}$$

Use the given information to find the value of x.

11. Area = 39 cm²



$$\text{Area} = \frac{1}{2}h(b_1 + b_2)$$

$$39 = \frac{1}{2}(6)(x + 9)$$

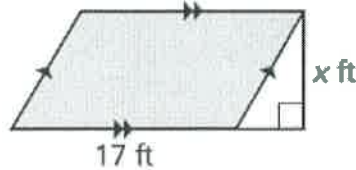
$$39 = 3(x + 9)$$

$$39 = 3x + 27$$

$$1a = 3x$$

$$\boxed{x = 4 \text{ cm}}$$

12. Area = 102 ft²



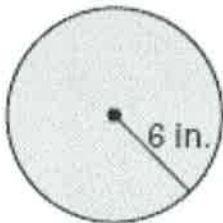
$$\text{Area} = bh$$

$$\frac{102}{17} = \frac{17x}{17}$$

$$\boxed{x = 6 \text{ ft}}$$

For #13 – 14, please find the circumference and area of each circle.

13.



$$C = 2\pi r$$

$$C = 2\pi(6)$$

$$C = 12\pi$$

$$\boxed{C \approx 37.7 \text{ in}}$$

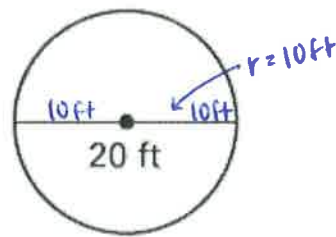
$$A = \pi r^2$$

$$A = \pi(6)^2$$

$$A = 36\pi$$

$$\boxed{A \approx 113.0 \text{ in}^2}$$

14.



$$C = \pi d$$

$$C = \pi(20)$$

$$\boxed{C \approx 62.8 \text{ ft}}$$

$$A = \pi r^2$$

$$A = \pi(10)^2$$

$$A = 100\pi$$

$$\boxed{A \approx 314 \text{ ft}^2}$$

→ arc length/circumference

→ one time around the circle

15. The outside horse of a carousel travels a distance of 81.64 feet in one revolution. What is the diameter of the carousel?



$$C = \pi d$$

$$81.64 = \pi d$$

$$\frac{81.64}{3.14} = \frac{3.14d}{3.14}$$

$$d \approx 26 \text{ ft}$$

16. The radius of a tire on a car is 10.5 inches. A car begins to roll down a hill and the tires revolve 5 times before being stopped. How far did the car travel?

↳ circumference

$$C = 2\pi r$$

$$C = 2\pi(10.5)$$

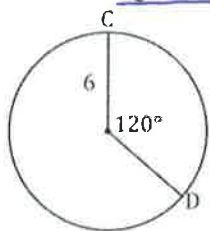
$$C = 21\pi$$

$$C \approx 65.94 \text{ in} \leftarrow \text{one revolution}$$

5 revolutions:

$$65.94 \times 5 = 329.7 \text{ in}$$

17. Find the length of \widehat{CD} . Round your answer to the nearest hundredth.



$$\frac{\text{arc length}}{2\pi(6)} = \frac{120}{360}$$

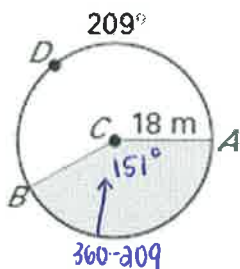
$$\text{arc length} = \frac{120}{360} \cdot 12\pi$$

$$360 \cdot \text{arc length} = 120 \cdot 12 \cdot \pi$$

$$\frac{360 \cdot \text{arc length}}{360} = \frac{4521.6}{360}$$

$$\text{arc length} \approx 12.56 \text{ units}$$

18. Find the area of the shaded sector ABC. Round your answer to the nearest hundredth.



$$\frac{\text{area of sector}}{\pi(18)^2} = \frac{151}{360}$$

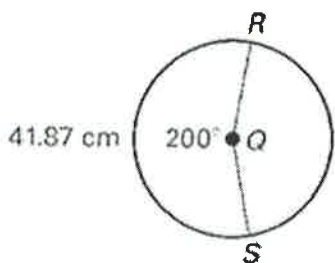
$$\text{area of sector} = \frac{151}{360} \cdot 324\pi$$

$$360 \cdot \text{area of sector} = 151 \cdot 324 \cdot \pi$$

$$\frac{360 \cdot \text{area of sector}}{360} = \frac{153621.36}{360}$$

$$\text{area of sector} \approx 426.73 \text{ m}^2$$

19. Please find the circumference of $\odot Q$. Round your answer to the nearest hundredth.



$$\frac{41.87}{2\pi r} = \frac{200}{360}$$

$$15073.2 = 200 \cdot 2\pi r$$

$$\frac{15073.2}{1256} = \frac{1256r}{1256}$$

$$r = 12 \text{ cm}$$

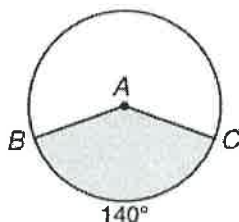
$$C = 2\pi r$$

$$C = 2\pi(12)$$

$$C = 24\pi$$

$$C \approx 75.36 \text{ cm}$$

20. Please find the radius of $\odot A$, given that the area of the shaded sector BAC is 395.64 mm²



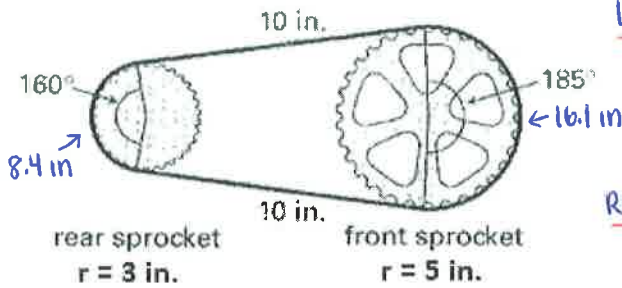
$$\frac{395.64}{\pi r^2} = \frac{140}{360}$$

$$140\pi r^2 = 142430.4$$

$$\frac{439.6r^2}{439.6} = \frac{142430.4}{439.6}$$

$$\sqrt{r^2} = \sqrt{324} \Rightarrow r = 18 \text{ mm}$$

21. The chain of a bicycle travels along the front and the rear sprockets. The radius of each sprocket is shown. About how long is the chain which goes around the entire figure?



Left side: $\frac{\text{arc length}}{2\pi(3)} = \frac{160}{360} \Rightarrow 360 \text{ arc length} = 160 \cdot 2\pi(3)$
 $\frac{360 \text{ arc length}}{360} = \frac{3014.4}{360}$

arc length = 8.4 in

Right side: $\frac{\text{arc length}}{2\pi(5)} = \frac{185}{360} \Rightarrow 360 \text{ arc length} = 185 \cdot 2\pi(5)$
 $\frac{360 \text{ arc length}}{360} = \frac{5809}{360}$

arc length = 16.1 in

Total perimeter (chain) = 8.4 + 10 + 16.1 + 10
 = 44.6 inches

22. The diagonal of one kite is three times as long as the other diagonal. If the area of the kite is 121.5 in², please find the length of each diagonal.

Area = $\frac{1}{2} d_1 d_2$

121.5 = $\frac{1}{2} (x)(3x)$

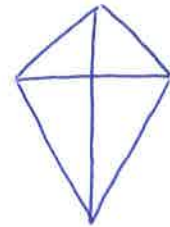
121.5 = $\frac{1}{2} (3x^2)$

$\frac{121.5}{1.5} = \frac{1.5x^2}{1.5}$

81 = x²

x = 9

So d₁ = x = 9 in
 d₂ = 3x = 3(9) = 27 in

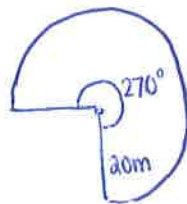
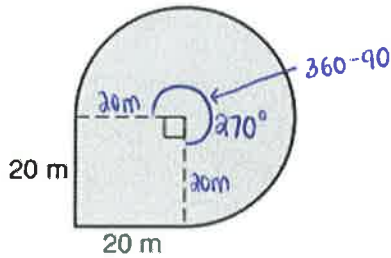


d₁ = x

d₂ = 3x

↑
three times as long

23. Find the area of the figure below. Round to the nearest hundredth.



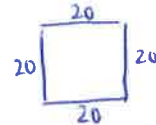
Area of sector = $\frac{270}{360} \pi (20)^2$

Area = $\frac{270}{400\pi} = \frac{270}{360}$

360 · Area = 270 · 400π

$\frac{360 \cdot \text{Area}}{360} = \frac{339120}{360}$

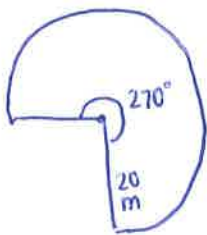
Area = 942 m²



A = (20)(20)
 A = 400 m²

Total Area =
 942 + 400
 = 1342 m²

24. What is the perimeter of the figure in question 9?



$\frac{\text{arc length}}{2\pi(20)} = \frac{270}{360}$

$\frac{\text{arc length}}{40\pi} = \frac{270}{360}$

360 · arc length = 270 · 40π

$\frac{360 \cdot \text{arc length}}{360} = \frac{33912}{360}$

arc length = 94.2 m

Total perimeter = arc length + 2 sides of square

= 94.2 + 20 + 20

= 134.2 m

Answer Key

- | | | | |
|-----------------------------|--------------------------------|---|-------------------------|
| 1. 48 units ² ✓ | 7. 378 in ² ✓ | 13. C ≈ 37.7 cm, A ≈ 113.04 cm ² ✓ | 19. 75.37 cm ✓ |
| 2. 224 units ² ✓ | 8. 192 units ² ✓ | 14. C ≈ 62.8 ft, A ≈ 314 ft ² ✓ | 20. 18 mm ✓ |
| 3. 160 units ² ✓ | 9. 75 m ² ✓ | 15. 26 ft ✓ | 21. 44.51 in |
| 4. 120 units ² ✓ | 10. 303.6 units ² ✓ | 16. 329.7 in ✓ | 22. 9 in and 27 in ✓ |
| 5. 81 units ² ✓ | 11. 4 cm ✓ | 17. 12.56 units ✓ | 23. 1342 m ² |
| 6. 270 units ² ✓ | 12. 6 ft ✓ | 18. 426.73 m ² ✓ | 24. 134.2 m |