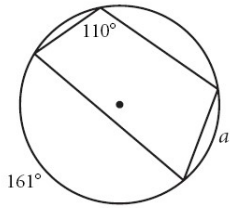


(5 points each) Find the exact answer to each problem. Leave all answers in terms of π .

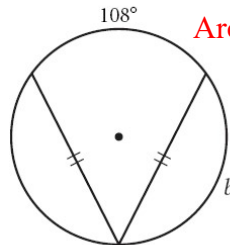
1. $a = \underline{59^\circ}$



$a + 161 = 2(110)$
Inscribed Angle
Conjecture

$a = 59$
unlabeled arc is

2. $b = \underline{126^\circ}$

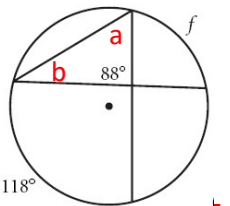


congruent to b by the Chord
Arcs Conjecture

$108 + 2b = 360$

$2b = 252$
 $b = 126$

3. $f = \underline{66^\circ}$



$a = \frac{1}{2}(118) = 59$
Inscribed Angles
Conj.

$59 + 88 + b = 180$
Angles of a Triangle

$b = 180$

$b = 33$ and $b = \frac{1}{2}f$ Inscribed Angle

$33 = \frac{1}{2}f \Rightarrow f = 66$

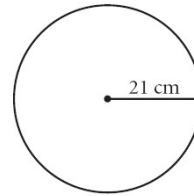
4. What is the circumference?

$C = \underline{42\pi \text{ cm}}$

$C = 2\pi r$

Circumference Conj.

$C = 2\pi(21) = 42\pi$

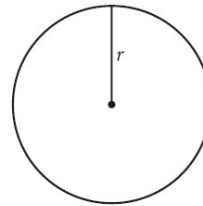


5. Circumference is 24π m.

$C = 2\pi r$

Circumference Conj.

$r = \underline{12 \text{ m}}$



$24\pi = 2\pi r$

$24 = 2r$

(2 points each) \overline{AB} is tangent to circle R, $\overline{AC} \perp \overline{BE}$, $m\angle BED = 38^\circ$, and $m\widehat{HD} = 50^\circ$.

6. $m\angle EBD = \underline{25^\circ}$ $\angle EBD$ is an inscribed angle to \widehat{HD}

7. $m\angle ACE = \underline{52^\circ}$ The angles of $\triangle EYC$ add to 180°

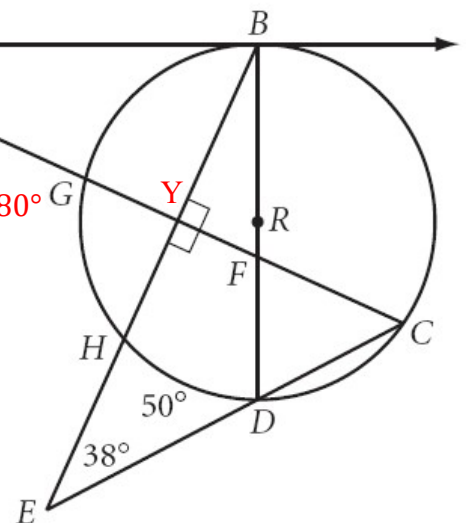
8. $m\widehat{GB} = \underline{76^\circ}$ **Answer #11 first** $m\widehat{GD} + m\widehat{GB} = 180^\circ$

9. $m\widehat{GBD} = \underline{256^\circ}$ $m\widehat{GB} + 180^\circ = m\widehat{GBD}$

10. $m\angle DBA = \underline{90^\circ}$ \overline{RB} is a radius to tangent \overline{AB}

11. $m\widehat{GD} = \underline{104^\circ}$ $\angle ACE$ is an inscribed angle to \widehat{GD}

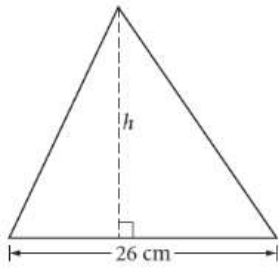
12. $m\angle DFC = \underline{65^\circ}$ The angles of $\triangle BFY$ add to 180°
 $m\angle BFY = 65$ and $\angle BFY \cong \angle DFC$ because they are vertical angles



(4 points each) Find the missing measure. The figures are not drawn to scale.

13. $h = 16$ cm

Area = 208 cm²



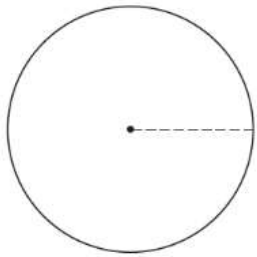
$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(26)(16)$$

$$A = 208$$

14. The circumference is 36π cm.

Area = 324π cm²



$$C = 2\pi r$$

$$36\pi = 2\pi r$$

$$36 = 2r$$

$$18 = r$$

$$A = \pi r^2$$

$$A = \pi(18)^2$$

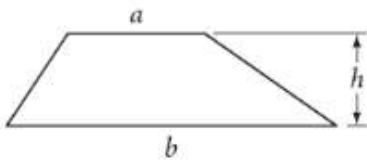
$$A = 324\pi$$

15. Area = 756 cm²

$h = 18$ cm

$a = 39$ cm

$b =$ 45 cm



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

$$756 = \frac{1}{2}(39 + b)(18)$$

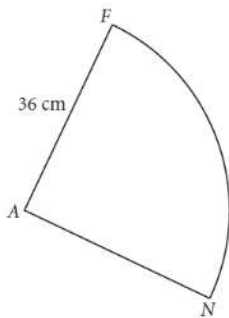
$$756 = 9(39 + b)$$

$$84 = 39 + b$$

$$45 = b$$

16. The area of the sector is 144π cm²

$m\angle FAN =$ 40°



$$A = \frac{a}{360}(\pi r^2)$$

$$144\pi = \frac{a}{360}(\pi(36)^2)$$

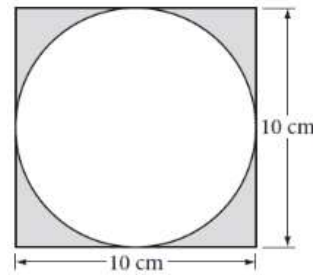
$$144\pi = \frac{a}{360}(1296\pi)$$

$$144 = \frac{a}{360}(1296)$$

$$\frac{1}{9} = \frac{a}{360}$$

$$40 = a$$

17. Area of shaded region $(100 - 25\pi)$ cm² ≈ 21.46 cm²



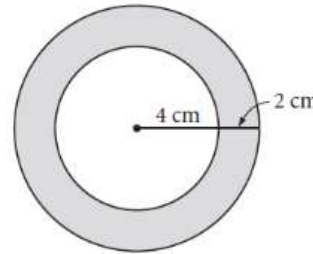
$$A = bh - \pi r^2$$

$$A = 10^2 - \pi(5)^2$$

$$A = 100 - 25\pi$$

$$A \approx 21.46$$

18. Area of shaded region = 20π cm² ≈ 62.83 cm²



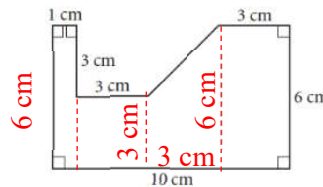
$$A = \pi R^2 - \pi r^2$$

$$A = \pi(6)^2 - \pi(4)^2$$

$$A = 36\pi - 16\pi$$

$$A = 20\pi$$

19. Area = 46.5 cm²



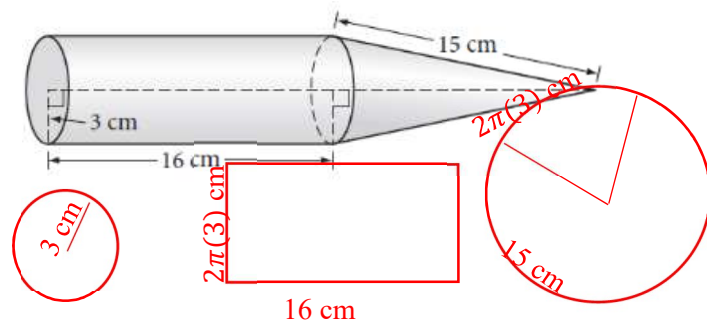
$$A = bh + bh + \frac{1}{2}(b_1 + b_2)h + bh$$

$$A = (1)(6) + (3)(3) + \frac{1}{2}(3 + 6)(3) + (3)(6)$$

$$A = 6 + 9 + 13.5 + 18$$

$$A = 46.5$$

20. Surface area = 150π cm²



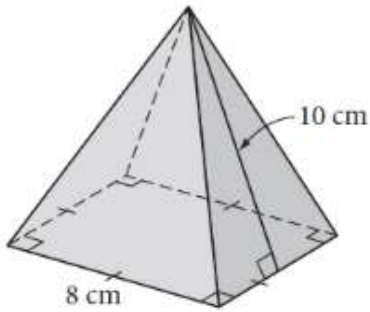
$$SA = \pi r^2 + bh + \pi rl$$

$$SA = \pi(3)^2 + (6\pi)(16) + \pi(3)(15)$$

$$SA = 9\pi + 96\pi + 45\pi$$

$$SA = 150\pi$$

21. Surface area = 224 cm²



$$SA = bh + 4\left(\frac{1}{2}bh\right)$$

$$SA = (8)(8) + 4\left(\frac{1}{2}(8)(10)\right)$$

$$SA = 64 + 4(40)$$

$$SA = 224$$

22. A regular octagon has area 690 square feet and side length 20 feet. Find the apothem to the nearest tenth of a foot.

$$A = \frac{1}{2}asn$$

$$690 = \frac{1}{2}a(8)(20)$$

$$690 = a(80)$$

$$8.6 \approx a$$

(6 points each) Complete.

23. Al's Pizzeria sells cheese pizza by the slice, according to the figure. Which slice gives the best deal (the most pizza per dollar)?

Giant

$$\frac{90}{360} = \frac{1}{4}$$

$$2.25 \cdot 4 = 9$$

It would cost

\$9.00 for a whole
pizza at this price

Regular

$$\frac{60}{360} = \frac{1}{6}$$

$$1.60 \cdot 6 = 9.6$$

It would cost

\$9.60 for a whole
pizza at this price

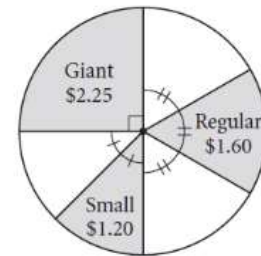
Small

$$\frac{45}{360} = \frac{1}{8}$$

$$1.20 \cdot 8 = 9.6$$

It would cost

\$9.60 for a whole
pizza at this price



Al's pizza-by-the-slice prices

Giant is the best deal

24. Mr. James wants to coat the ceiling, walls, and floor of a rectangular storeroom with a flame-retardant material that costs \$39.95 per gallon. The dimensions of the room are 7 m by 9 m by 4.5 m. If one gallon covers 110 m², how much will Mr. James need to spend to protect the storeroom?

$$SA = 2(7 \times 9) + 2(9 \times 4.5) + 2(7 \times 4.5)$$

$$SA = 2(63) + 2(40.5) + 2(31.5)$$

$$SA = 126 + 81 + 63$$

$$SA = 270 \text{ m}^2$$

$$\frac{270}{110} = 2.45$$

$$3(39.95) = 119.85$$

Mr. James will need to spend \$119.85

Mr. James will need to buy 3 gallons of material.

(2 points each) Complete each statement.

25. The _____ is the side opposite the right angle in a right triangle.

hypotenuse

26. In a right triangle, if x and y are the lengths of the legs and z is the length of the hypotenuse, then the Pythagorean Theorem states _____.

$$x^2 + y^2 = z^2$$

27. In an isosceles right triangle, if a leg has length x, then the hypotenuse has length _____.

$$x\sqrt{2}$$

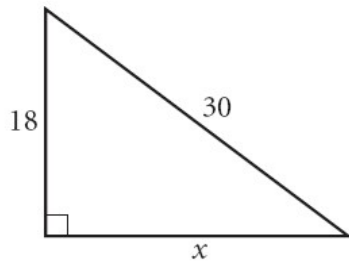
28. In a 30°-60°-90° triangle, if the hypotenuse has length y, then the shorter leg has length _____ and the longer leg has length _____.

$$\frac{y}{2}$$

$$\frac{y\sqrt{3}}{2}$$

(3 points each) Solve each problem. All measurements are in centimeters.

29. $x = \underline{24 \text{ cm}}$



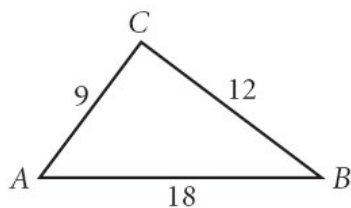
$$18^2 + x^2 = 30^2$$

$$324 + x^2 = 900$$

$$x^2 = 576$$

$$x = 24$$

30. Is $\triangle ABC$ a right triangle?



$$9^2 + 12^2 \stackrel{?}{=} 18^2$$

$$81 + 144 \stackrel{?}{=} 324$$

$$225 \neq 324$$

$\triangle ABC$ is not a right triangle.

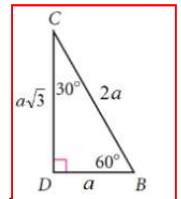
31. What is the length of the hypotenuse of a right triangle with legs of length 80 feet and 150 feet?

$$80^2 + 150^2 = x^2 \quad 6400 + 22500 = x^2$$

$$28900 = x^2 \quad 170 = x$$

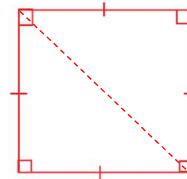
170 feet

32. What is the length of the shorter leg of a 30° - 60° - 90° triangle with a longer leg length of $24\sqrt{3}$?



24

33. If the area of a square is 225 cm^2 , what is the length of the diagonal?



$$A = s^2$$

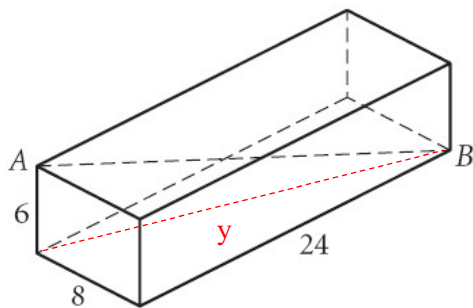
$$225 = s^2$$

$$15 = s$$

diagonal length $15\sqrt{2} \text{ cm}$

(4 points) Solve each problem. All measurements are in centimeters.

34. $AB = \underline{26 \text{ cm}}$



$$8^2 + 24^2 = y^2$$

$$y^2 + 6^2 = AB^2$$

$$64 + 576 = y^2$$

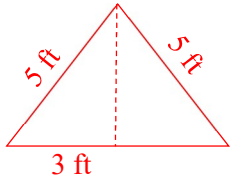
$$640 + 36 = AB^2$$

$$26 = AB$$

$$640 = y^2$$

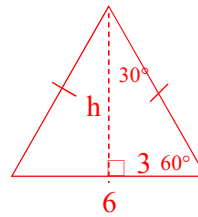
$$676 = AB^2$$

35. Oscar's dog house is shaped like a tent. The slanted sides are both 5 feet long and the bottom of the house is 6 feet across. What is the height of his dog house, in feet, at its tallest point?



$$\begin{aligned}3^2 + h^2 &= 5^2 \\9 + h^2 &= 25 \\h^2 &= 16 \\h &= 4 \\4 \text{ feet}\end{aligned}$$

36. Find the area of an equilateral triangle with sides measuring 6 meters.



$$\begin{aligned}h &= 3\sqrt{3} \\A &= \frac{1}{2}bh \\A &= \frac{1}{2}(6)(3\sqrt{3}) \\A &= (3)(3\sqrt{3}) \\A &= 9\sqrt{3} \text{ m}^2\end{aligned}$$

(6 points) Complete.

37. Determine whether $\triangle ABC$ with vertices $A(2, 4)$, $B(10, 2)$, and $C(7, 7)$ is scalene, isosceles, or equilateral.

$$AB = \sqrt{(2 - 10)^2 + (4 - 2)^2} = \sqrt{(-8)^2 + (2)^2} = \sqrt{64 + 4} = \sqrt{68}$$

$$BC = \sqrt{(10 - 7)^2 + (2 - 7)^2} = \sqrt{(3)^2 + (-5)^2} = \sqrt{9 + 25} = \sqrt{34}$$

$$CA = \sqrt{(7 - 2)^2 + (7 - 4)^2} = \sqrt{(-5)^2 + (3)^2} = \sqrt{25 + 9} = \sqrt{34}$$

Isosceles