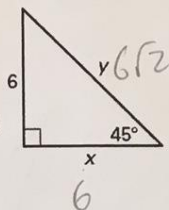


Final Exam Review

1. **Multiple Choice** Find the values of x and y .

- (A) $x = 6, y = 6\sqrt{3}$
- (B) $x = 3\sqrt{2}, y = 6\sqrt{2}$
- (C) $x = 2\sqrt{3}, y = 4\sqrt{3}$
- (D) $x = 6, y = 6\sqrt{2}$**
- (E) $x = 6\sqrt{2}, y = 6$



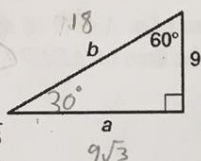
2. **Multiple Choice** The ratio of the lengths of two equilateral triangles is 4:9. What is the ratio of their areas?

- (A) 4:9
- (B) 9:4
- (C) 2:3
- (D) 16:81**
- (E) 81:16

$4^2 = 9^2$
 $16:81$

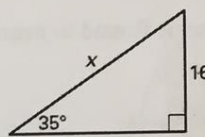
3. **Multiple Choice** Find the values of a and b .

- (A) $a = 9, b = 9\sqrt{2}$
- (B) $a = 18, b = 9\sqrt{3}$**
- (C) $a = 9\sqrt{3}, b = 18$
- (D) $a = 3\sqrt{3}, b = 6\sqrt{3}$
- (E) $a = 6\sqrt{3}, b = 3\sqrt{3}$



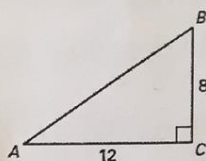
4. **Multiple Choice** Find the value of x .

- (A) $16 \sin 35^\circ$
- (B) $16 \cos 35^\circ$
- (C) $\frac{\sin 35^\circ}{16}$
- (D) $\frac{16}{\sin 35^\circ}$**
- (E) $16 \tan 35^\circ$



$\sin(35) = \frac{16}{x}$
 $x \sin(35) = 16$
 $x = \frac{16}{\sin(35)}$

5. In the diagram below, what is the measure of $\angle A$ to the nearest tenth of a degree?

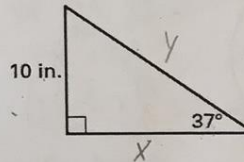


- (A) 41.8°
- (B) 48.2°
- (C) 33.7°**
- (D) 1°
- (E) 42°

$\tan^{-1}(\frac{8}{12})$

6. **Multiple Choice** Find the perimeter of the triangle. Round to the nearest tenth.

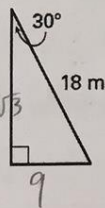
- (A) 42.2 in.
- (B) 39.9 in.**
- (C) 37.2 in.
- (D) 39.1 in.
- (E) 33.1 in.



$\tan(37) = \frac{10}{x}$
 $x = \frac{10}{\tan(37)} \approx 13.27$
 $\sin(37) = \frac{10}{y}$
 $y = \frac{10}{\sin(37)} \approx 16.62$

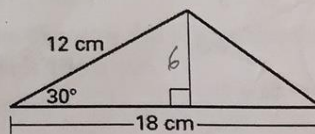
7. **Multiple Choice** Find the area of the figure. Round to the nearest tenth if necessary.

- (A) 68.2 m^2
- (B) 93.5 m^2
- (C) 70.1 m^2**
- (D) 140.3 m^2
- (E) 187.0 m^2



8. **Multiple Choice** Find the area of the triangle. Round to the nearest tenth.

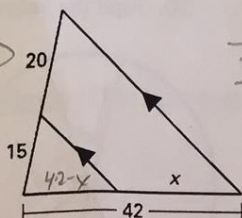
- (A) 93.5 cm^2
- (B) 62.4 cm^2
- (C) 54 cm^2**
- (D) 140.3 cm^2
- (E) 81 cm^2



$\frac{1}{2}(18)(6)$

9. **Multiple Choice** Find the value of x .

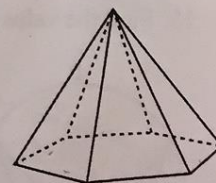
- (A) 22
- (B) 24**
- (C) 26
- (D) 28
- (E) 30



$\frac{15}{20} = \frac{42-x}{x}$
 $15x = 840 - 20x$
 $35x = 840$
 $x = 24$

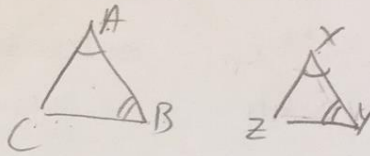
10. Name the solid below

- a) hexagonal prism
- b) hexagonal pyramid**
- c) triangular prism
- d) triangular pyramid



11. If $\triangle ABC \sim \triangle XYZ$, which of the following is **not** true? Draw a diagram to help you.

- a) $\angle A \cong \angle X$ ✓
 b) $\triangle BCA \sim \triangle YZX$ ✓
 c) $\frac{AB}{XY} = \frac{BC}{YX}$
 d) $\angle B \cong \angle Y$ ✓



12. Given $\triangle ABC \sim \triangle DEF$.

a. What is the scale factor from $\triangle ABC$ to $\triangle DEF$? $\frac{5}{3}$

b. What is the ratio of the areas from $\triangle ABC$ to $\triangle DEF$? $25:9$

c. Solve for x and y . Round to nearest tenth.

$$\frac{y}{4} = \frac{5}{3} \quad \frac{9}{x} = \frac{5}{3}$$

$$3y = 20 \quad 27 = 5x$$

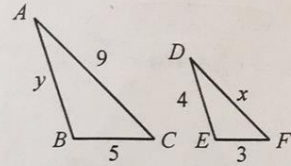
$$y = \frac{20}{3} \quad x = \frac{27}{5}$$

d. If the area of $\triangle ABC$ is 16 square units, what is the area of $\triangle DEF$?

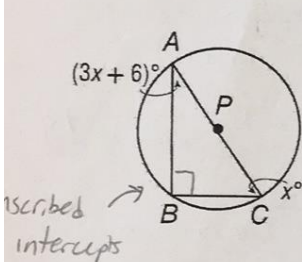
$$\frac{25}{9} = \frac{16}{x}$$

$$25x = 144$$

$$x = 5.76 \text{ units}^2$$



13. Find the $m\angle A$.



$$3x + 6 + x = 90$$

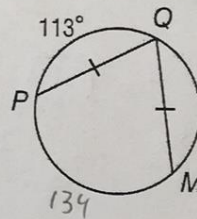
$$4x + 6 = 90$$

$$4x = 84$$

$$x = 21$$

$$m\angle A = 3(21) + 6 = 69^\circ$$

14. Find the $m\angle Q$.

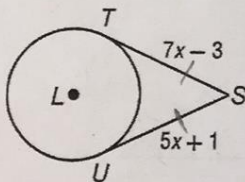


2 chords \cong \rightarrow corresponding arcs are \cong

$$m\widehat{PM} = 360 - 2(113) = 134$$

$$m\angle Q = \frac{1}{2}(134) = 67^\circ$$

15. Find the value of x .

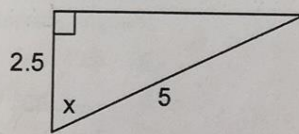


$$7x - 3 = 5x + 1$$

$$2x = 4$$

$$x = 2$$

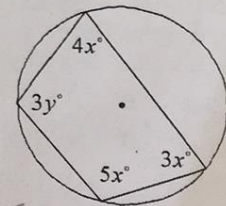
16. Find the value of x .



$$\cos(x) = \frac{2.5}{5}$$

$$\cos^{-1}\left(\frac{2.5}{5}\right) = 60^\circ$$

17. Find the value of x and y .



$$4x + 5x = 180$$

$$9x = 180$$

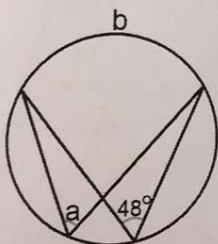
$$x = 20$$

$$3y + 3(20) = 180$$

$$3y + 60 = 180$$

$$y = 40$$

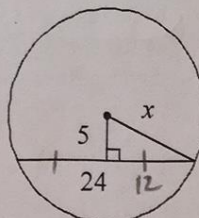
18. Find the value of a and b .



$$a = 48^\circ$$

$$b = 96^\circ$$

19. Find the value of x .



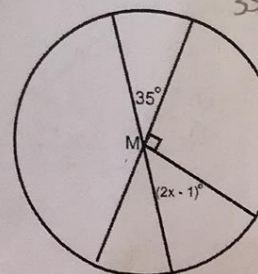
$$5^2 + 24^2 = x^2$$

$$25 + 576 = x^2$$

$$601 = x^2$$

$$x = 24.5$$

20. Find the value of x .



$$35 + 2x - 1 + 90 = 180$$

$$2x + 124 = 180$$

$$2x = 56$$

$$x = 28$$

21. Write the equation of a circle with a center at (4, -6) that passes through the point (5, 2).

① Find radius: $r = \sqrt{(4-5)^2 + (-6-2)^2}$
 $= \sqrt{(-1)^2 + (-8)^2}$
 $= \sqrt{1+64}$
 $= \sqrt{65}$

② Write equation

$$(x-4)^2 + (y+6)^2 = 65$$

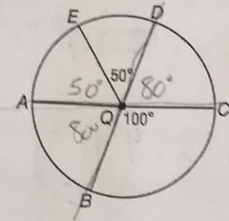
23. The diameters of circle Q are \overline{AC} and \overline{DB} . Identify each arc as a major arc, minor arc, or semicircle of the circle. Then find the arc's measure.

a) $m\widehat{AE}$ Minor Arc
 50°

b) $m\widehat{AB}$ Minor Arc
 80°

c) $m\widehat{EDA}$ Major Arc
 130°

d) $m\widehat{ADC}$ Semi Circle
 180°



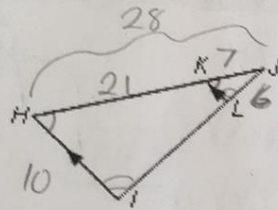
24. If $JK = 7$ ft., $KH = 21$ ft., $HI = 10$ ft., and $JL = 6$ ft. Find KL .

$$\triangle JKL \sim \triangle JHI$$

$$\frac{7}{28} = \frac{x}{10} \quad 70 = 28x$$

$$x = 2.5$$

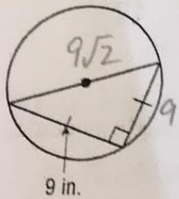
$$KL = 2.5 \text{ ft}$$



25. Find the **volume** of a hemisphere with a diameter of 12 in. Leave your answer in terms of π .

$$V = \frac{2}{3}\pi r^3 = \frac{2}{3}\pi(6)^3 = \frac{2}{3}\pi(216) = 144\pi \text{ in}^3$$

26. Find the exact **circumference** of the circle.



$$d = 9\sqrt{2}$$

$$C = 9\sqrt{2}\pi \text{ in}$$

27. Find the diameter and circumference of a circle the area is $196\pi \text{ cm}^2$.

$$A = 196\pi$$

$$\pi r^2 = 196\pi$$

$$r^2 = 196$$

$$r = 14$$

$$d = 28 \text{ cm}$$

$$C = 28\pi \text{ cm}$$

28. Find the **volume** of the right cone. Leave your answer in terms of π .

$$V = \frac{1}{3}\pi r^2 h$$

$$= \frac{1}{3}\pi(7)^2(24)$$

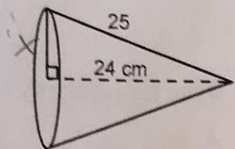
$$= \frac{1}{3}\pi(1176) = 392\pi \text{ cm}^3$$

$$x^2 + 24^2 = 25^2$$

$$x^2 + 576 = 625$$

$$x^2 = 49$$

$$x = 7$$

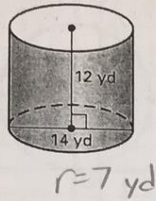


29. Find the **volume** of the right cylinder. Leave your answer in terms of π .

$$V = \pi r^2 h$$

$$= \pi (7)^2 (12)$$

$$= \boxed{588\pi \text{ yd}^3}$$



30. What is the **most specific name** of the right prism below. Then, find **volume** of the right prism.

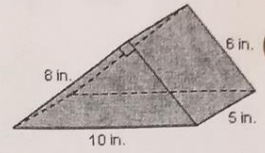
Triangular Prism

$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 6 \cdot 8\right) (5)$$

$$V = (24)(5)$$

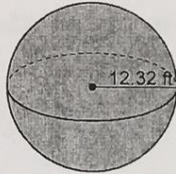
$$V = \boxed{120 \text{ in}^3}$$



31. Find the **volume** of the sphere. Round to the nearest tenth.

$$V = \frac{4}{3} \pi (12.32)^3$$

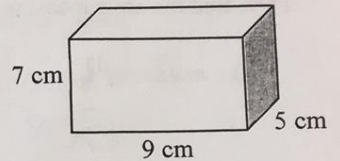
$$V \approx \boxed{7832.9 \text{ ft}^3}$$



32. Find the **volume** of the rectangular prism.

$$V = 9 \cdot 5 \cdot 7$$

$$V = \boxed{315 \text{ cm}^3}$$



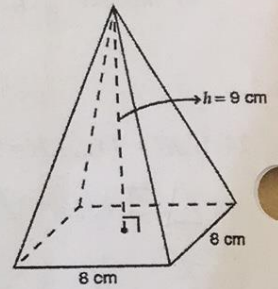
33. Find the **volume** of the figure to the right. Round to the nearest tenth if necessary.

$$V = \frac{1}{3} Bh$$

$$V = \frac{1}{3} (8 \cdot 8)(9)$$

$$V = \frac{1}{3} (64)(9)$$

$$\rightarrow \boxed{V = 192 \text{ cm}^3}$$



34. Solve the right triangle to the right. Round to the nearest tenth.

$$m\angle C = 180 - 90 - 57$$

$$= 33$$

$$\tan(57) = \frac{12}{x}$$

$$\sin(57) = \frac{12}{y}$$

$$x \tan(57) = 12$$

$$y \sin(57) = 12$$

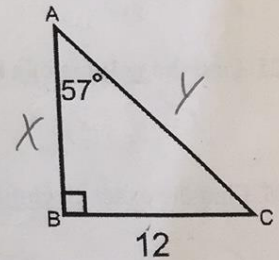
$$x = \frac{12}{\tan(57)} \approx 7.8$$

$$y = \frac{12}{\sin(57)} \approx 14.3$$

$$m\angle C = \underline{33^\circ}$$

$$AB \approx \underline{7.8}$$

$$AC \approx \underline{14.3}$$



35. Determine if lengths 12, 17, 9 can represent the lengths of the sides of a triangle. If so, classify the triangle as acute, right, or obtuse.

$$12 + 9 > 17$$

$$21 > 17 \checkmark$$

Yes, it is a Δ

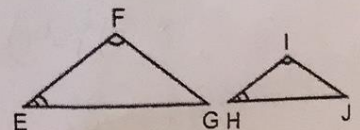
$$17^2 \quad 9^2 + 12^2$$

$$289 \quad 81 + 144$$

$$289 > 225 \quad \boxed{\text{Obtuse}}$$

36. Write the similarity statement and postulate/theorem that proves the two triangles are similar.

$$\triangle EFG \sim \triangle HIJ \text{ by AA}$$



37. The ratio of the angles of $\triangle ABC$ is 5:6:7. Find the smallest angle measure. Draw a diagram to help!

$$5x + 6x + 7x = 180$$

$$18x = 180$$

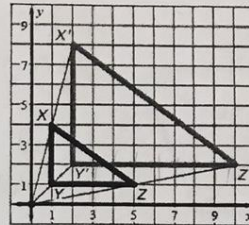
$$x = 10$$

Smallest \angle : $5(10) = \boxed{50^\circ}$

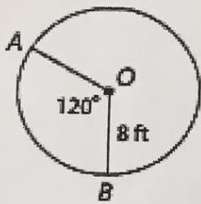


38. Use the diagram to the right to determine whether the dilation centered at the origin is a reduction or enlargement. Then find the scale factor.

Enlargement $y'z' = 8$
 $yz = 4$
 $k = \frac{\text{image}}{\text{pre-image}} = \frac{8}{4} = \boxed{2}$



39. Find the length of \widehat{AB} . Round to the nearest hundredth.



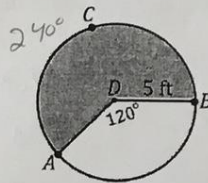
$$\frac{\text{arc length}}{\text{circumference}} = \frac{\text{arc measure}}{360}$$

$$\frac{x}{76\pi} = \frac{120}{360}$$

$$360x = 1920\pi$$

$$x \approx \boxed{16.76 \text{ ft}}$$

40. Find the area of the shaded region. Round to the nearest hundredth.



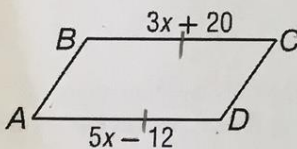
$$\frac{\text{sector area}}{\text{circle area}} = \frac{\text{arc measure}}{360}$$

$$\frac{x}{25\pi} = \frac{240}{360}$$

$$360x = 6000\pi$$

$$x \approx \boxed{52.36 \text{ ft}^2}$$

41. For parallelogram $ABCD$, find x .

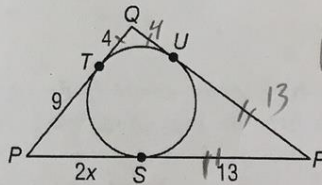


$$3x + 20 = 5x - 12$$

$$32 = 2x$$

$$x = \boxed{16}$$

42. Find the value of x and the perimeter of $\triangle PQR$.



$$P = 2(4) + 2(13) + 2(9)$$

$$P = \boxed{52 \text{ units}}$$

$$9 = 2x$$

$$x = \boxed{4.5}$$

43. Which of the following is a property of all parallelograms?

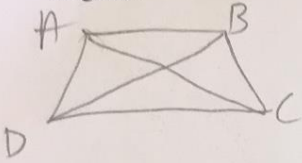
- a. The diagonals are congruent.
- b. The diagonals are perpendicular.
- c. The diagonals bisect opposite angles.
- d. The diagonals bisect each other.

44. What special property does not set a square apart from a rectangle?

- a. The diagonals are perpendicular.
- b. The diagonals are congruent.
- c. All four sides are congruent.
- d. The diagonals bisect opposite angles.

← Also true for rectangles

45. $ABCD$ is an isosceles trapezoid with diagonals \overline{AC} and \overline{BD} . If $AC = (2x + 10)$ in. and $BD = 56$ in., find x . Draw a diagram!

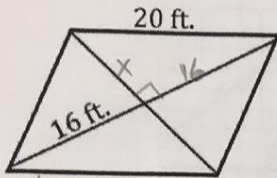


$$2x + 10 = 56$$

$$2x = 46$$

$$x = 23$$

46. Find the area of the rhombus.



$$d_1 = 24$$

$$d_2 = 32$$

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

$$A = \frac{1}{2} (24)(32) = 384 \text{ ft}^2$$

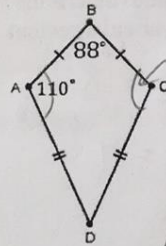
$$x^2 + 16^2 = 20^2$$

$$x^2 + 256 = 400$$

$$x^2 = 144$$

$$x = 12$$

47. Find the $m\angle D$ kite $ABCD$.

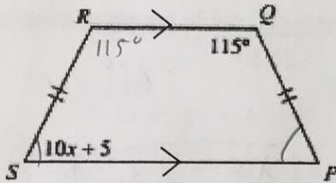


$$88 + 110 + 110 = 308$$

$$360 - 308 = 52^\circ$$

$$m\angle D = 52^\circ$$

48. Using the isosceles trapezoid below, find the value of x and the $m\angle P$.



$$115 + 10x + 5 = 180$$

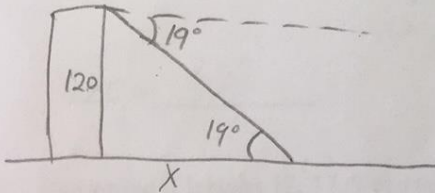
$$10x + 120 = 180$$

$$10x = 60$$

$$x = 6$$

$$m\angle P = 10(6) + 5 = 60 + 5 = 65^\circ$$

49. From the top of a 120-foot-high tower, an air traffic controller observes an airplane on the runway at an angle of depression of 19° . How far from the base of the tower is the airplane? Round your answer to the nearest hundredth.

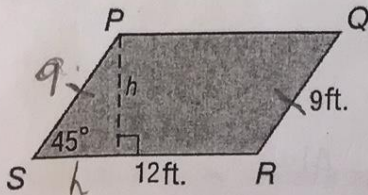


$$\tan(19) = \frac{120}{x}$$

$$x \tan(19) = 120$$

$$x = \frac{120}{\tan(19)} \approx 348.51 \text{ ft}$$

50. Find the exact area of the parallelogram.



$$\frac{45}{1} = \frac{45}{h} = \frac{90}{\sqrt{2}}$$

$$\frac{1}{h} = \frac{\sqrt{2}}{9}$$

$$9 = h\sqrt{2}$$

$$h = \frac{9}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{9\sqrt{2}}{2}$$

$$A = bh$$

$$A = \frac{9\sqrt{2}}{2} \cdot 12 = 54\sqrt{2} \text{ ft}^2$$