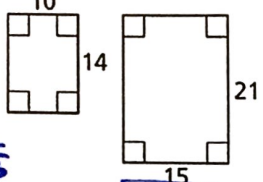
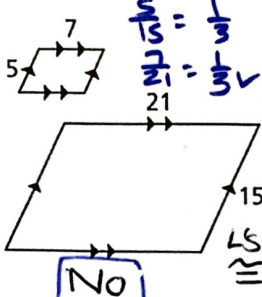
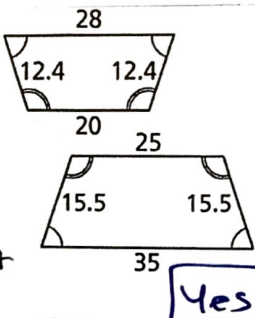


PRACTICE: Similarity

Determine whether the polygons are similar.

1. 
 $\frac{10}{15} = \frac{14}{21} = \frac{2}{3}$ ✓
 All $\angle s = 90^\circ$
Yes

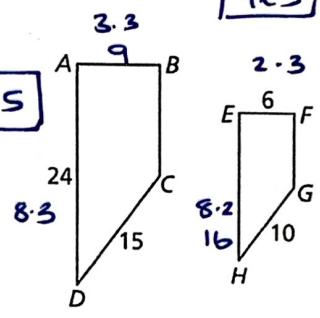
2. 
 $\frac{5}{15} = \frac{1}{3}$
 $\frac{7}{21} = \frac{1}{3}$
 LS not \cong
No

3. 
 $\frac{28}{35} = 0.8$
 $\frac{20}{25} = 0.8$ ✓
 All $\angle s \cong$
Yes

In the diagram, $ABCD \sim EFGH$. Find the following.

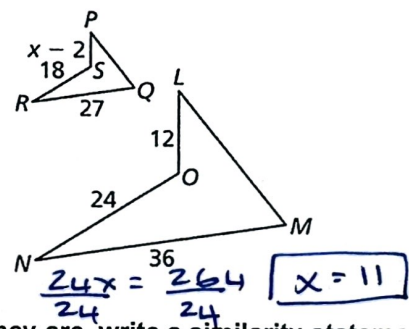
4. scale factor $15 : 10$
5. $EH = 16$
6. $AB = 9$

$3 : 2 = \frac{3}{2} = 1.5$



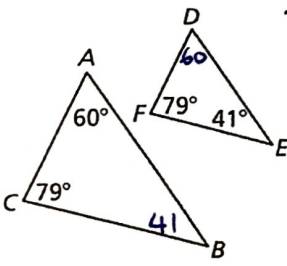
In the diagram, $LMNO \sim PQRS$. Complete the proportions and congruence statements.

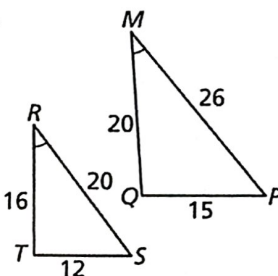
7. $\angle P \cong \angle L$
8. $\angle M \cong \angle Q$
9. $\frac{MN}{RQ} = \frac{LM}{?PQ}$

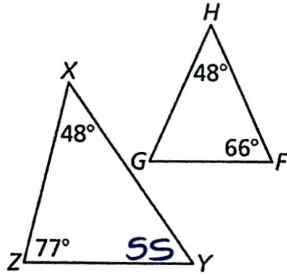


$\frac{x-2}{12} = \frac{18}{24}$
 $24x - 48 = 216$
 $+48 \quad +48$

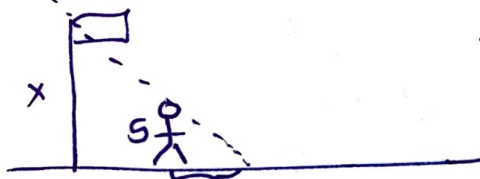
Determine whether the triangles are similar. If they are, write a similarity statement. Explain your reasoning.

11. 
 $\triangle ABC \sim \triangle DEF$
 AA

12. 
 $\frac{16}{20} = \frac{4}{5}$
 $\frac{20}{26} = \frac{10}{13}$
 NOT \sim

13. 
 NOT \sim

14. Your geometry class goes outside to measure the height of the school's flagpole. A student who is 5 feet tall stands up straight and casts a shadow that is 8 feet long. At the same time the flagpole casts a shadow that is 24 feet long. What is the height of the flagpole?

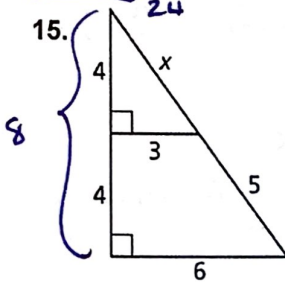


$$\frac{x}{5} = \frac{24}{8}$$

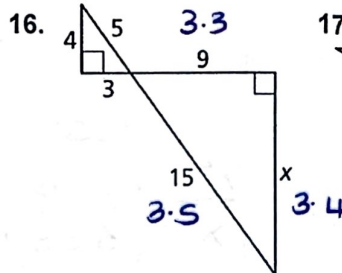
$$\frac{8x}{8} = \frac{120}{8}$$

$$x = 15 \text{ ft}$$

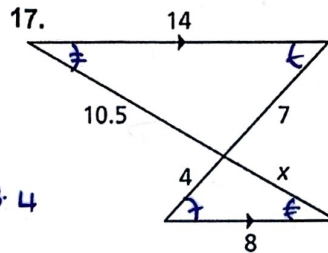
Find the value of x that makes the triangles similar.



$$x = 5$$



$$x = 12$$

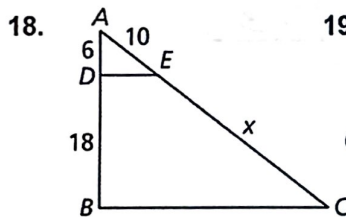


$$\frac{4}{7} = \frac{x}{10.5}$$

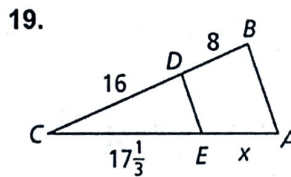
$$\frac{42}{7} = \frac{7x}{7}$$

$$x = 6$$

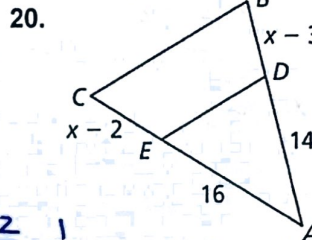
Find the value of x so that $\overline{BC} \parallel \overline{DE}$.



$$x = 30$$



$$x = \frac{17\frac{1}{3}}{2} = \frac{52}{3} \cdot \frac{1}{2} = \frac{52}{6} = 8\frac{2}{3}$$



$$\frac{14}{x-3} = \frac{16}{x-2}$$

$$14x - 28 = 16x - 48$$

$$-14x \quad -14x$$

$$-28 = 2x - 48$$

$$+48 \quad +48$$

$$\frac{20}{2} = \frac{2x}{2}$$

$$10 = x$$

Determine the length of the segment.

21. $\frac{AG}{10} = \frac{AG}{6} \Rightarrow AG = 2.4$

22. $\frac{FC}{2} = \frac{14}{4} \Rightarrow FC = 7$

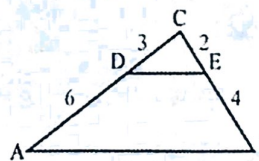
23. $\frac{FE}{6} = \frac{8}{10} \Rightarrow FE = 4.8$

24. $\frac{ED}{22} = \frac{2}{4} \Rightarrow ED = 11$

25. $\frac{AE}{2.4+6} = \frac{4.8}{4.8} \Rightarrow AE = 13.2$

26. $\frac{AD}{6} = \frac{10}{4} \Rightarrow AD = 22$

27. **PROOF:**

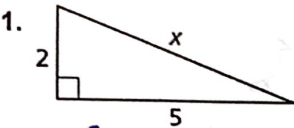


Given: $AD = 6$; $DC = 3$
 $BE = 4$; $EC = 2$
Prove: $\triangle CDE \sim \triangle CAB$

STATEMENTS	REASONS
1. $AD = 6$; $DC = 3$ $BE = 4$, $EC = 2$	1. Given
2. $\frac{DC}{CA} = \frac{3}{9} = \frac{1}{3}$ $\frac{CE}{CB} = \frac{2}{6} = \frac{1}{3}$	2. Substitution
3. $\frac{DC}{CA} = \frac{CE}{CB}$	3. Transitive Property
4. $\angle C \cong \angle C$	4. Reflexive
5. $\triangle CDE \sim \triangle CAB$	5. SAS

PRACTICE: Right Triangles and Trigonometry

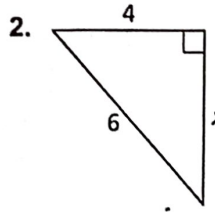
Find the value of x . Then tell whether the side lengths form a Pythagorean triple.

1. 

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

$$4 + 25 = x^2$$

$$\sqrt{29} = x \quad \text{no}$$

2. 

$$4^2 + x^2 = 6^2$$

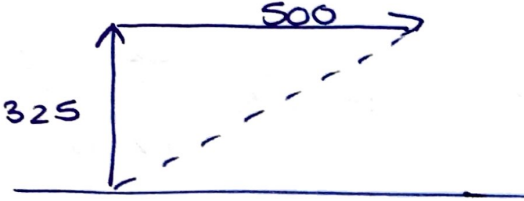
$$16 + x^2 = 36$$

$$-16 \quad -16$$

$$\sqrt{x^2} = \sqrt{20}$$

$$x = 2\sqrt{5} \quad \text{no}$$

3. A helicopter rose vertically 325 meters and then flew east 500 meters. How far is the helicopter from its starting point?



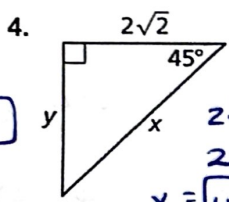
$$x^2 = 325^2 + 500^2$$

$$x^2 = 105625 + 250000$$

$$\sqrt{x^2} = \sqrt{355625}$$

$$x \approx 596.34 \text{ m}$$

Find the values of x and y . Write your answer in simplest form.

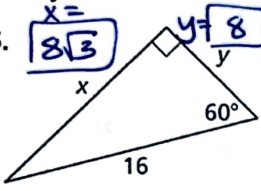
4. 

$$y = 2\sqrt{2}$$

$$2\sqrt{2} \cdot \sqrt{2}$$

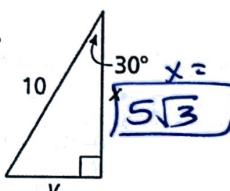
$$2 \cdot 2$$

$$x = 4$$

5. 

$$x = 8\sqrt{3}$$

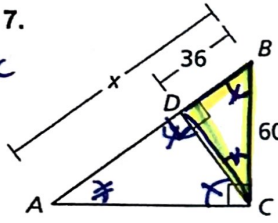
$$y = 8$$

6. 

$$x = 5\sqrt{3}$$

$$y = 5$$

Identify the similar triangles. Then find the value of x .

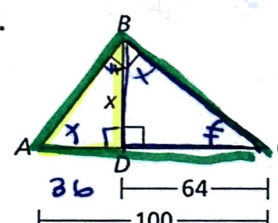
7. 

$\triangle CBD \sim \triangle ABC$
 $\sim \triangle CD$

$$\frac{36}{60} = \frac{60}{x}$$

$$\frac{36x}{60} = \frac{3600}{36}$$

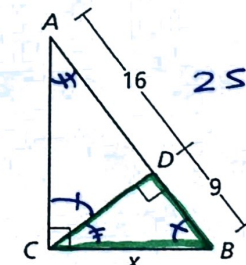
$$x = 100$$

8. 

$$\frac{x}{36} = \frac{64}{x}$$

$$\sqrt{x^2} = \sqrt{2304}$$

$$x = 48$$

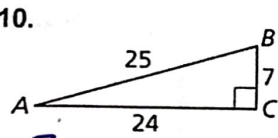
9. 

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

$$\sqrt{x^2} = \sqrt{225}$$

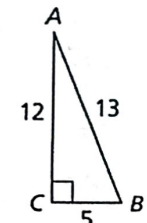
$$x = 15$$

Find $\tan A$ and $\tan B$. Write each answer as a fraction and as a decimal rounded to the nearest hundredth.

10. 

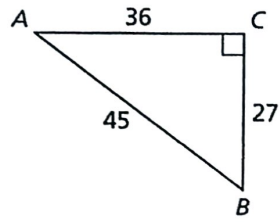
$$\tan A = \frac{7}{24} = .29$$

$$\tan B = \frac{24}{7} = 3.43$$

11. 

$$\tan A = \frac{5}{12} = .42$$

$$\tan B = \frac{12}{5} = 2.4$$

12. 

$$\tan A = \frac{27}{36} = .75$$

$$\tan B = \frac{36}{27} = 1.33$$

Find the value of x . Round your answer to the nearest tenth.

13.



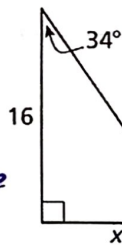
$$\cos 72 = \frac{4}{x}$$

$$x \cos 72 = 4$$

$$x = \frac{4}{\cos 72}$$

$$x = 12.9$$

14.

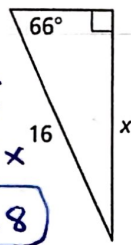


$$\tan 34 = \frac{x}{16}$$

$$16 \cdot \tan 34 = x$$

$$x = 10.8$$

15.



$$\sin 66 = \frac{x}{16}$$

$$16 \cdot \sin 66 = x$$

$$14.6 = x$$

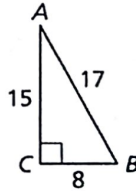
Use the diagram. Write your answer as a fraction and as a decimal rounded to the nearest hundredth.

16. $\sin A = \frac{8}{17} \approx .47$

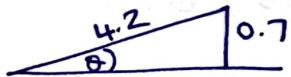
17. $\cos A = \frac{15}{17} \approx .88$

18. $\sin B = \frac{15}{17} \approx .88$

19. $\cos B = \frac{8}{17} \approx .47$



20. A wheelchair ramp is 4.2 meters long. It rises up 0.7 meter. What is the angle of elevation to the nearest tenth of a degree?

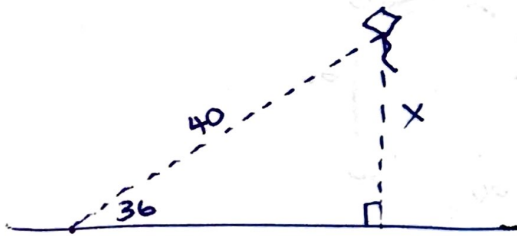


$$\sin \theta = \frac{0.7}{4.2}$$

$$\sin^{-1}\left(\frac{0.7}{4.2}\right) = \theta$$

$$9.6^\circ = \theta$$

21. You go to the park on a windy day to fly a kite. You have released 40 feet of string. The string makes an angle of 36° with the ground. How high is the kite in the air?

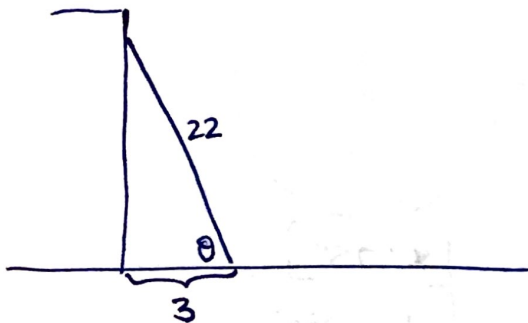


$$\sin 36 = \frac{x}{40}$$

$$x = \sin 36 \cdot 40$$

$$x = 23.5 \text{ ft}$$

22. A 22-foot ladder is resting against the side of a building. The bottom of the ladder is 3 feet from the building. Find the measure of the angle the ladder makes with the ground. Round your answer to the nearest tenth of a degree.



$$\cos \theta = \frac{3}{22}$$

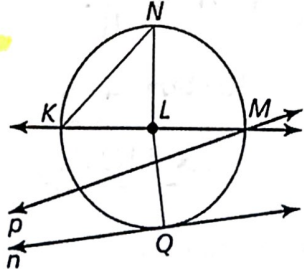
$$\cos^{-1}\left(\frac{3}{22}\right) = \theta$$

$$\theta = 82.2^\circ$$

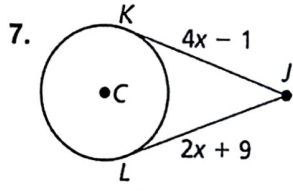
PRACTICE: Circles

Identify the line or segment as a radius, chord, diameter, secant, or tangent of $\odot L$.

- \overline{KM} diameter
- \overline{LN} radius
- \overline{PM} secant
- line n tangent
- \overline{LQ} radius
- \overline{KN} chord

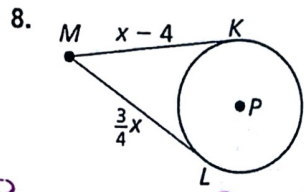


Points K and L are points of tangency. Find the value of x .



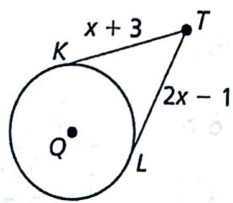
$$4x - 1 = 2x + 9$$

$$\begin{array}{r} -2x \\ -2x \\ \hline 2x - 1 = 9 \\ +1 \quad +1 \\ \hline 2x = 10 \\ \frac{2x}{2} = \frac{10}{2} \\ x = 5 \end{array}$$



$$x - 4 = \frac{3}{4}x$$

$$\begin{array}{r} x - 4 = \frac{3}{4}x \\ -x \quad -x \\ \hline -4 = -\frac{1}{4}x - \frac{4}{4} \\ -4 + 4 = -\frac{1}{4}x - \frac{4}{4} + 4 \\ 0 = -\frac{1}{4}x + \frac{12}{4} \\ \frac{1}{4}x = \frac{12}{4} \\ x = 12 \end{array}$$

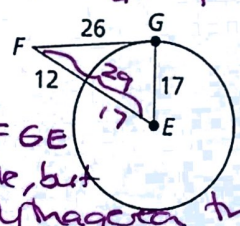


$$x + 3 = 2x - 1$$

$$\begin{array}{r} x + 3 = 2x - 1 \\ -x \quad -x \\ \hline 3 = x - 1 \\ +1 \quad +1 \\ \hline 4 = x \end{array}$$

10. Determine whether \overline{FG} is tangent to $\odot E$. Explain.

No. If \overline{FG} was tangent, then $\overline{FG} \perp \overline{GE}$ and $\triangle FGE$ would be a right triangle, but



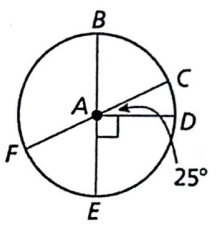
$$26^2 + 17^2 = 29^2$$

$$676 + 289 = 841$$

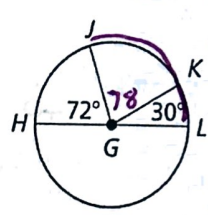
$$965 \neq 841$$

it is not since the Pythagorean theorem doesn't work. Find the indicated measure.

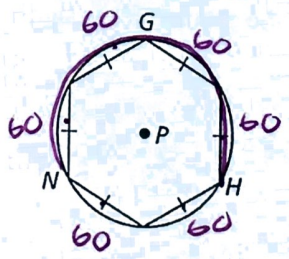
11. $m\widehat{DEF} = 155^\circ$



12. $m\widehat{JKL} = 108^\circ$

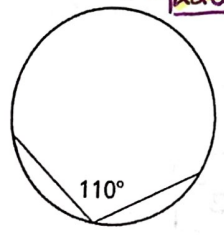


13. $m\widehat{NGH} = 240^\circ$

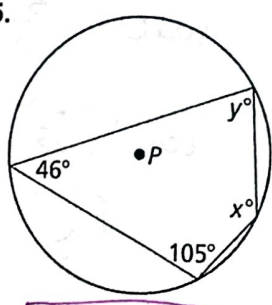


Find the value of the variable(s).

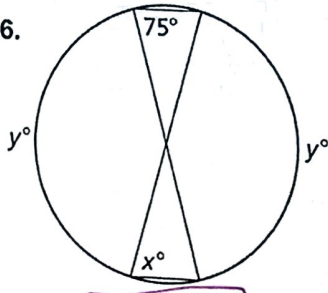
14. $x^\circ = 220^\circ$



15. $x = 134^\circ$
 $y = 75^\circ$

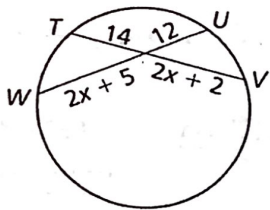


16. $x = 75^\circ$
 $y = 150^\circ$



Find the measure of the indicated line segment.

17. \overline{UW}



$$14(2x+2) = 12(2x+5)$$

$$28x + 28 = 24x + 60$$

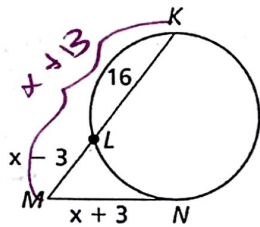
$$-24x - 28 - 24x - 28$$

$$\frac{4x}{4} = \frac{32}{4}$$

$$x = 8$$

$$UW = 12 + 2(8) + 5 = 33$$

18. \overline{NM}



$$(x+3)^2 = (x+13)(x-3)$$

$$x^2 + 6x + 9 = x^2 + 10x - 39$$

$$-6x + 39 - 6x + 39$$

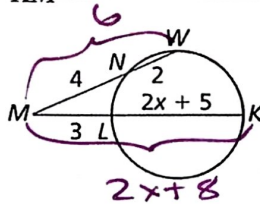
$$\frac{48}{4} = \frac{4x}{4}$$

$$12 = x$$

$$NM = 12 + 3$$

$$NM = 15$$

19. \overline{KM}



$$6 \cdot 4 = 3(2x+8)$$

$$24 = 6x + 24$$

$$0 = 6x$$

$$0 = x$$

$$KM = 3 + 2(0) + 5$$

$$KM = 8$$

Identify the center and the radius of the circle.

20. $(x-1)^2 + (y+3)^2 = 4$

$$(1, -3) \quad r=2$$

21. $(x-2)^2 + (y-1)^2 = 16$

$$(2, 1) \quad r=4$$

22. $x^2 + y^2 - 6y - 5 = 0$

$$x^2 + y^2 - 6y + 9 = 5 + 9$$

$$x^2 + (y-3)^2 = 14$$

$$(0, 3) \quad r=\sqrt{14}$$

23. $x^2 + y^2 - 2x + 8y + 8 = 0$

$$x^2 - 2x + 1 + y^2 + 8y + 16 = -8 + 1 + 16$$

$$(x-1)^2 + (y+4)^2 = 9$$

$$(1, -4) \quad r=3$$

Use the given information to write the standard equation of the circle.

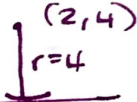
24. a circle with center $(1, 2)$ and radius 5

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

25. a circle with center $(-3, 5)$ and radius 2

$$(x+3)^2 + (y-5)^2 = 4$$

26. Write the standard equation of a circle that is tangent to the x-axis, with the center located at $(2, 4)$.



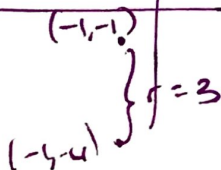
$$(x-2)^2 + (y-4)^2 = 16$$

27. Write the standard equation of a circle with the center at $(-1, -4)$ that passes through the point

$(-1, -1)$.

$r=3$

$$(x+1)^2 + (y+4)^2 = 9$$

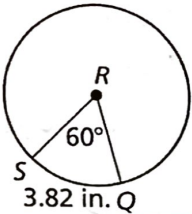


PRACTICE:

Area and Volume

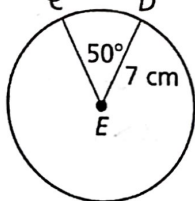
Find the indicated measure.

1. circumference of $\odot R$



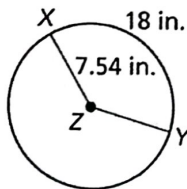
$$3.82 \times 6 = \boxed{22.92 \text{ in}}$$

2. arc length of \widehat{CD}



$$L = \frac{50}{360} \cdot 2\pi(7) = \frac{5}{36} \cdot 14\pi = \frac{35\pi}{18} \approx 6.1 \text{ cm}$$

3. $m\widehat{XY}$



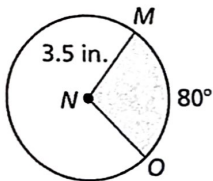
$$\frac{m}{360} \cdot 2\pi(7.54) = 18$$

$$\frac{15.08\pi m}{15.08\pi} = \frac{6480}{15.08\pi}$$

$$\boxed{m = 136.8^\circ}$$

Find the area of the shaded region.

10.

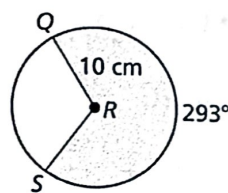


$$\frac{280}{360} \cdot \pi(3.5)^2$$

$$= \frac{24.5\pi}{9}$$

$$\approx \boxed{8.6 \text{ in}^2}$$

11.

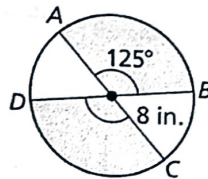


$$\frac{293}{360} \cdot \pi(10)^2$$

$$= \frac{29300\pi}{360}$$

$$\approx \boxed{255.7 \text{ cm}^2}$$

12.

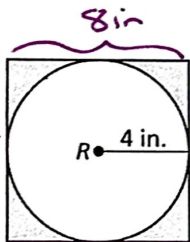


$$\frac{235}{360} \cdot \pi(8)^2$$

$$\frac{1600\pi}{36}$$

$$\approx \boxed{139.6 \text{ in}^2}$$

13.

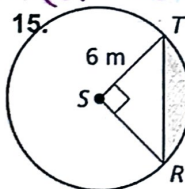


$$A_{\square} = 64$$

$$A_{\circ} = \pi(4)^2 = 16\pi$$

$$A_{\text{shaded}} = 64 - 16\pi \approx \boxed{13.7 \text{ in}^2}$$

15.

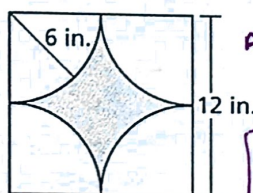


$$A_{\circ} = \pi(6)^2 = 36\pi$$

$$A_{\triangle} = \frac{36\pi}{4} = 9\pi$$

$$A_{\triangle} = \frac{1}{2} \cdot 6 \cdot 6 = 18$$

$$A_{\text{shaded}} = 9\pi - 18 \approx \boxed{10.3 \text{ m}^2}$$



$$A_{\square} = (12)(12) = 144$$

$$A_{\circ} = \pi r^2 = \pi(6)^2 = 36\pi$$

$$A_{\text{shaded}} = 144 - 36\pi \approx \boxed{30.9 \text{ in}^2}$$

16. Your friend is planting a circular garden full of different color pansies. Your friend plans to plant five different colors of equal amounts. The garden has a radius of 15 feet. How many square feet of space will each color cover?

$$A_{\circ} = \pi r^2 = \pi(15)^2 = 225\pi$$

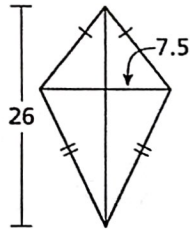
$$A_{\text{color}} = \frac{225\pi}{5}$$

$$= 45\pi$$

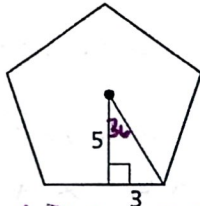
$$\approx \boxed{141.4 \text{ ft}^2}$$

Find the area of the polygon.

17. kite



18. regular pentagon



$$P = (6)(5) = 30$$

$$A = \frac{1}{2} \cdot a \cdot P = \frac{1}{2}(5)(30)$$

$$= 75 \text{ u}^2$$

19. regular decagon



$$A = \frac{1}{2} \cdot a \cdot P$$

$$= \frac{1}{2} \cdot 13.8(90)$$

$$= 623 \text{ u}^2$$

$$p = 9(10) = 90$$

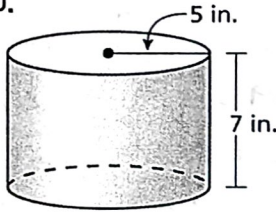
$$\tan 18 = \frac{4.5}{x}$$

$$x = \frac{4.5}{\tan 18}$$

$$x = 13.8$$

Find the volume of the solid.

20.



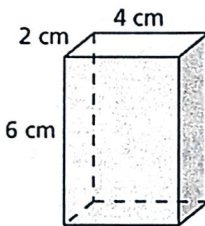
$$V = \pi r^2 h$$

$$= \pi(5)^2(7)$$

$$= 175\pi$$

$$\approx 549.8 \text{ in}^3$$

21.

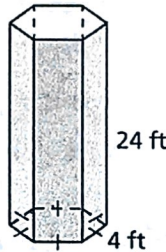


$$V = B \cdot h$$

$$= 4 \cdot 2 \cdot 6$$

$$= 48 \text{ cm}^3$$

22.



$$V = B \cdot h$$

$$= 24\sqrt{3} \cdot 24$$

$$= 576\sqrt{3}$$

$$\approx 997.7 \text{ ft}^3$$



$$A_{\text{hex}} = \frac{1}{2} \cdot 2\sqrt{3} \cdot 24$$

$$= 24\sqrt{3}$$

23. The Great Pyramid of Cheops is the largest pyramid in the world. It was built around 2500 B.C. by Khufu, or Cheops, a king of ancient Egypt. The pyramid has a square base of 230 meters on each side, and a height of 147 meters. Find the volume.



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$$V = \frac{1}{3} \cdot B \cdot h$$

$$= \frac{1}{3} \cdot (230)(230) \cdot 147$$

$$= 2,592,100 \text{ m}^3$$

$$r = 4.775$$

An official men's basketball has a diameter of 9.55 inches. The diameter of a women's basketball is 9.23 inches. $r = 4.615$

24. Find the difference of the volumes.

$$V_m = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi(4.775)^3 = 456 \text{ in}^3$$

$$V_w = \frac{4}{3}\pi(4.615)^3 = 411.7 \text{ in}^3$$

25. Find the difference of the surface areas.

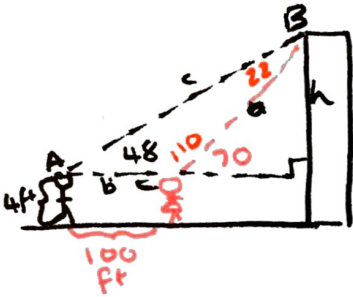
$$S_m = 4\pi r^2 = 4\pi(4.775)^2 = 286.5 \text{ in}^2$$

$$S_w = 4\pi(4.615)^2 = 267.6 \text{ in}^2$$

$$\text{difference} = 18.9 \text{ in}^2$$

MIXED PRACTICE

Emma is walking towards a tall building. Her eyes are 4 feet off of the ground. She sights the top of the building with an angle of elevation of 48° . She walks 100 feet closer and sights the top of the building with an angle of 70° . How tall is the building to the nearest foot?



In $\triangle ABC$:

$$\frac{a}{\sin 48} = \frac{100}{\sin 22}$$

$$a = \frac{100}{\sin 22} \cdot \sin 48$$

$$a = 198.4$$

In Right \triangle against the building

$$\sin 70 = \frac{h}{198.4}$$

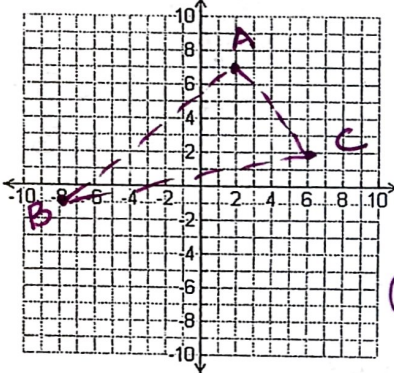
$$h = 198.4 \cdot \sin 70$$

$$= 186.4$$

$$+ 4 \text{ ft}$$

building is 190.4 ft

Graph the points below.
A (2, 7) B (-8, -1) C (6, 2)



a) Use the distance formula to find the perimeter

$$AB = \sqrt{(2+8)^2 + (7+1)^2} = \sqrt{100+64} = \sqrt{164}$$

$$BC = \sqrt{(6+8)^2 + (2+1)^2} = \sqrt{196+9} = \sqrt{205}$$

$$AC = \sqrt{(6-2)^2 + (2-7)^2} = \sqrt{16+25} = \sqrt{41}$$

$$P = \sqrt{164} + \sqrt{205} + \sqrt{41} \approx 33.5 \text{ units}$$

b) Classify the triangle as right, acute, obtuse. Explain why.

Pythagorean theorem

$$AB^2 + AC^2 = BC^2$$

$$(\sqrt{164})^2 + (\sqrt{41})^2 = 164 + 41 = 205$$

therefore Right \triangle

OR

$$m_{AB} = \frac{7+1}{2+8} = \frac{8}{10} = \frac{4}{5}$$

$$m_{AC} = \frac{7-2}{2-6} = \frac{5}{-4} = -\frac{5}{4}$$

slopes are opposite reciprocal so AB \perp AC

c) Classify the triangle as equilateral, isosceles, or scalene

All three sides have different lengths.

3. A cylinder has a height of 29 and surface area of 192π . Find the radius.

$$SA = 2\pi r^2 + 2\pi r h$$

$$\frac{192\pi}{2\pi} = \frac{2\pi r^2}{2\pi} + \frac{2\pi r(29)}{2\pi}$$

$$96 = r^2 + 29r$$

$$-96 \quad -96$$

$$0 = r^2 + 29r - 96$$

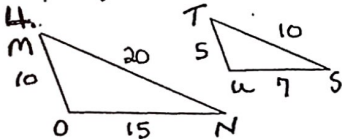
$$0 = (r+32)(r-3)$$

$$r = -32 \quad r = 3$$

$$\frac{-96}{32} = -3$$

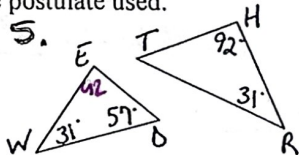
$$r = 3$$

Determine whether each pair of triangles can be proven similar using one of the triangle similarity postulates. If so, complete the similarity statement and identify the postulate used.



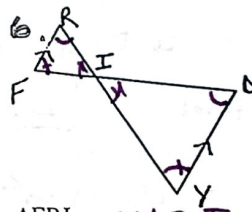
$\triangle AMO \sim$ Not similar.

By _____



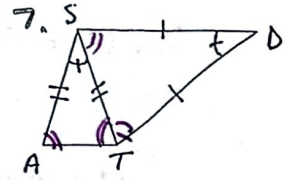
$\triangle WED \sim \triangle RHT$

By AA



$\triangle FRI \sim \triangle YDI$

By AA

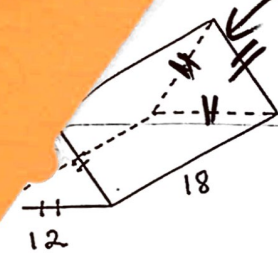


$\triangle SAT \sim \triangle DST$ or $\triangle DTS$

By AA or SAS

equilateral Δ

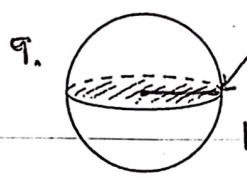
Find SA and vol.



$$h = \frac{1}{2}(12)(6\sqrt{3}) = 36\sqrt{3}$$

$$V = B \cdot h = (36\sqrt{3})(18) = 648\sqrt{3}$$

$$SA = 2\Delta's + 3 \square's = 2(36\sqrt{3}) + 3(18 \cdot 12) = 72\sqrt{3} + 648$$



Area of the great circle is 49π . Find SA and Vol.

$$SA = 4\pi(r)^2 = 4\pi(49) = 196\pi \approx 615.8$$

$$V = \frac{4}{3}\pi(r)^3 = \frac{4}{3}\pi(343) \approx 1436.8$$

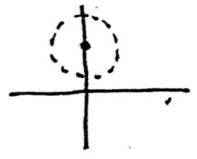
Write each of the following equations in standard form. State the center, radius, and sketch the circle.

10. $x^2 + y^2 - 8y + 7 = 0$

$$x^2 + y^2 - 8y + 16 = -7 + 16$$

$$x^2 + (y-4)^2 = 9$$

C: (0, 4) r=3

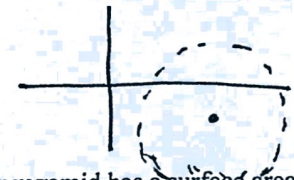


11. $x^2 + y^2 - 12x + 6y = 15$

$$x^2 - 12x + 36 + y^2 + 6y + 9 = 15 + 36 + 9$$

$$(x-6)^2 + (y+3)^2 = 60$$

C: (6, -3) r = $\sqrt{60} \approx 7.7$



12. The volume ratio for two similar pyramids is $\frac{27}{64}$. If the larger pyramid has a surface area of 240 cm^2 find the surface area of the smaller pyramid.

$$k^3 = \frac{27}{64} \rightarrow k = \frac{3}{4} \rightarrow k^2 = \frac{9}{16}$$

$$\frac{9}{16} = \frac{x}{240}$$

$$16x = 2160$$

x = 135 cm²

13. Determine the length of an arc with central angle 10° and radius of 5 cm.

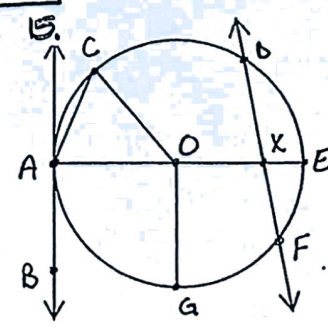
$$\text{arc length} = \frac{10}{360} \cdot 2\pi(5) \approx 0.873 \text{ cm}$$

14. A circle has a radius of 8. If the area of a sector of that circle is $\frac{80\pi}{9}$, what is the central angle of the sector?

$$\frac{80\pi}{9} = \frac{x}{360} \cdot \pi(8)^2$$

$$\frac{80\pi}{9} \times \frac{64\pi \cdot x}{360} \rightarrow 28800\pi = 576\pi \cdot x$$

$50^\circ = x$

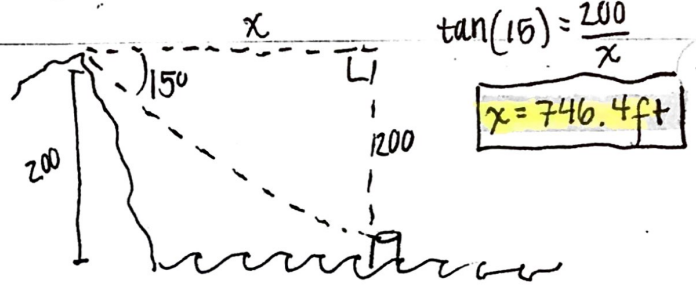
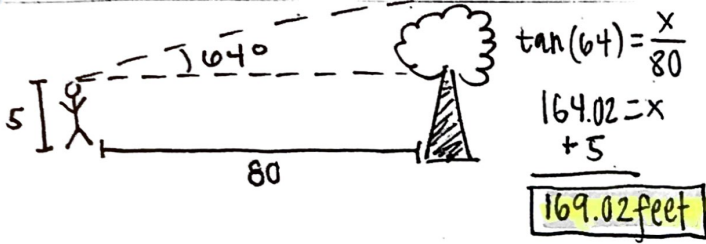


Name each object.

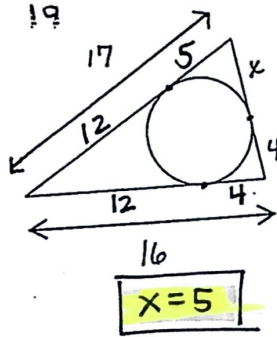
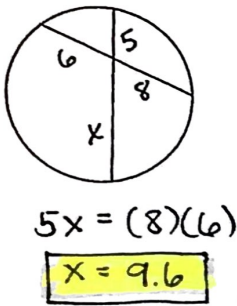
- \overline{CO} radius
- \widehat{AF} minor arc
- \widehat{AGE} semicircle
- \overline{AB} tangent
- \overline{DF} chord
- \overline{EA} diameter
- $\angle COE$ central angle
- \overline{DF} secant
- \widehat{FDA} major arc
- $\angle CAE$ inscribed angle

The angle of elevation to the top of a tree is 64° . If you are 80 ft from the tree and your eyes are 5 ft. high, how tall is the tree?

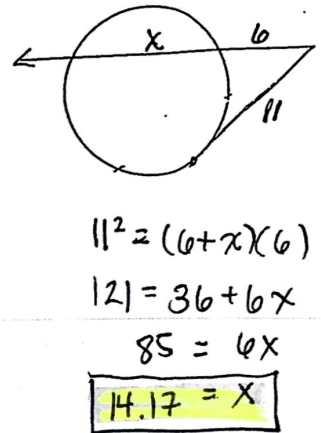
17. The angle of depression from the top of a 200 m high cliff to a buoy is 15° . How far is the buoy from the cliff? Disregard the eye height.



18.



20.



21. Find the volume of a cube with a surface area of 864 in^2 .

CUBE: 6 sides

$864 \div 6 = 144$

so each edge is 12 units

$V = 12 \cdot 12 \cdot 12 = 1728 \text{ in}^3$

22. A cylinder has a diameter of 8 and a height of 6. Find the surface area and volume.

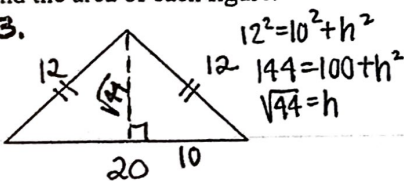


$SA = 2\pi r^2 + 2\pi rh$
 $= 2\pi(4)^2 + 2\pi(4)(6)$
 $= 2\pi(16) + 2\pi(24)$
 $= 32\pi + 48\pi$
 $= 80\pi$

$V = \pi r^2 h$
 $= \pi(4)^2(6)$
 $= 96\pi$

Find the area of each figure.

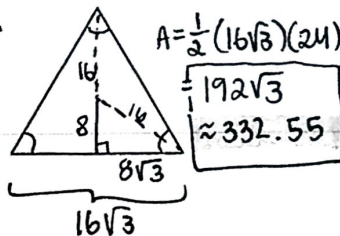
23.



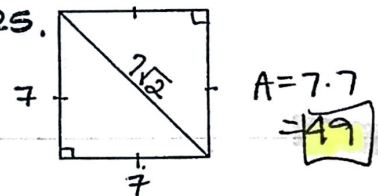
$A = \frac{1}{2}(20)(\sqrt{44})$

≈ 66.3

24.



25.



26a) Determine whether a triangle with the following sides is acute, right, or obtuse. 2, 9, 10.

$2^2 + 9^2 \stackrel{?}{=} 10^2$
 $4 + 81 \quad 100$
 $85 < 100$

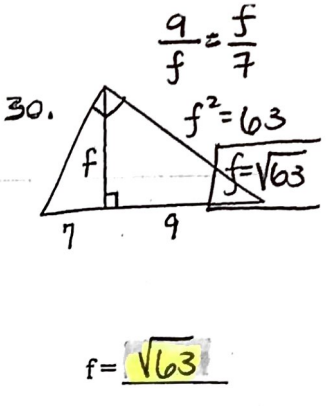
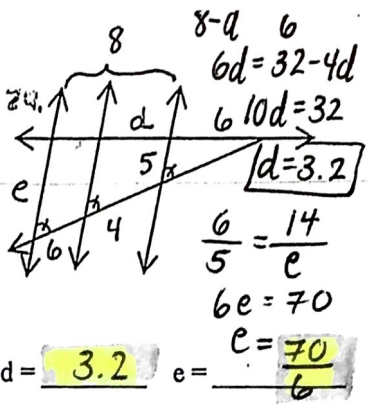
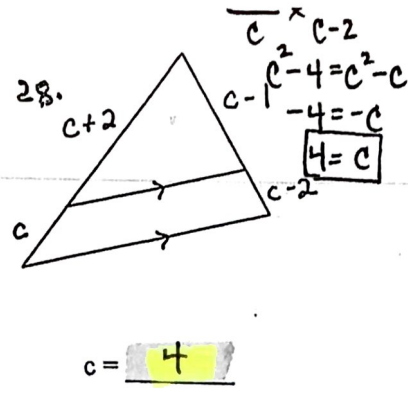
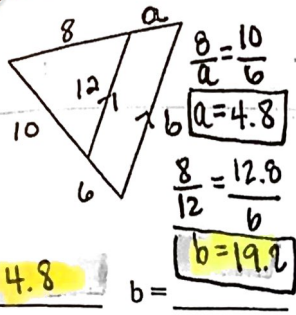
obtuse

b) What side length(s) instead of 2, would give a right triangle?

$\sqrt{19}, 9, 10$

$x^2 + 9^2 = 10^2$
 $x^2 + 81 = 100$
 $\sqrt{x^2} = \sqrt{19}$

for the missing variables.



31. The ratio of the corresponding edges of two similar prisms is $\frac{8}{5}$. Find the following ratios:

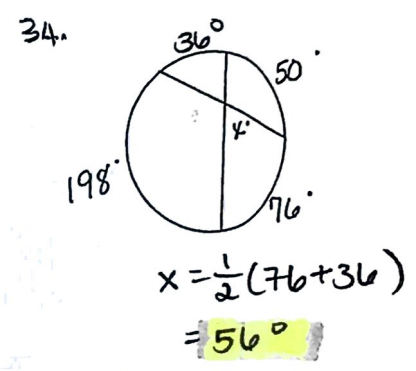
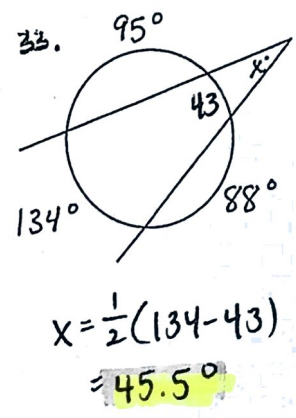
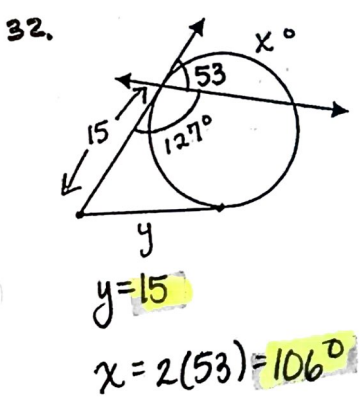
a) perimeters
 $\frac{8}{5}$

b) base areas
 $(\frac{8}{5})^2 = \frac{64}{25}$

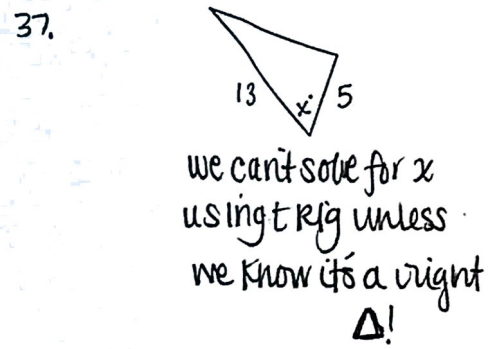
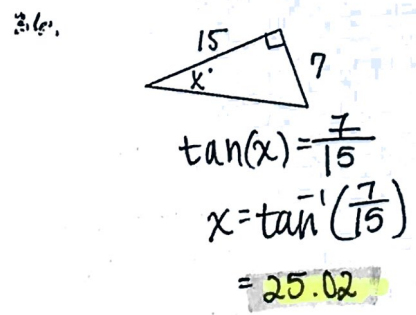
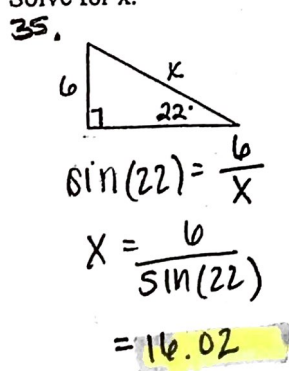
c) volumes
 $(\frac{8}{5})^3 = \frac{512}{125}$

d) heights
 $\frac{8}{5}$

Solve for x and or y in each diagram.



Solve for x.



38. A trapezoid has an area of 84 cm^2 , height of 7 cm and a base of 8 cm. Find the length of the other base.

$84 = \frac{1}{2}(8 + b_2)(7)$
 $168 = (8 + b_2)(7)$
 $168 = 56 + 7b_2$
 $b_2 = 16 \text{ cm}$

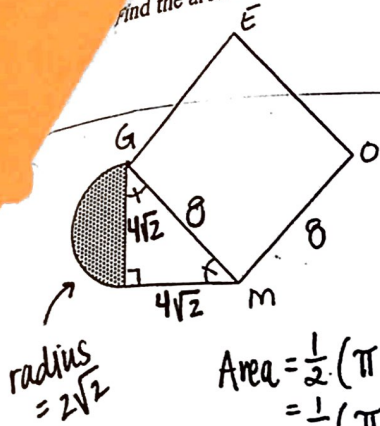
39. Find the following for \overline{AB} with A (5, 2) and B (-3, 6).

Length
 $d = \sqrt{(5 - (-3))^2 + (2 - 6)^2} = \sqrt{64 + 16} = \sqrt{80}$

Slope
 $m = \frac{6 - 2}{-3 - 5} = \frac{4}{-8} = -\frac{1}{2}$

Midpoint
 $(\frac{5 + (-3)}{2}, \frac{2 + 6}{2}) = (\frac{2}{2}, \frac{8}{2}) = (1, 4)$

GEOM is a square. The area of GEOM is 64.
Find the area of the semicircle.



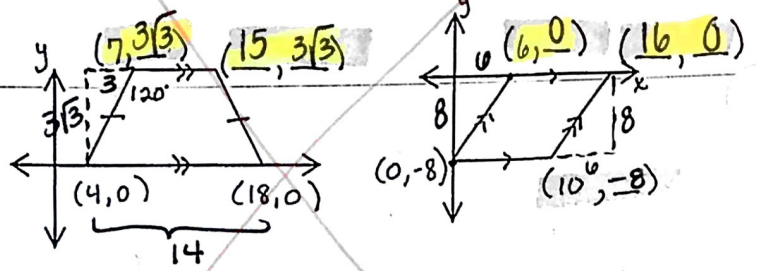
radius = $2\sqrt{2}$

$$\begin{aligned} \text{Area} &= \frac{1}{2} (\pi r^2) \\ &= \frac{1}{2} (\pi (2\sqrt{2})^2) \\ &= \frac{1}{2} (\pi 8) = \boxed{4\pi} \end{aligned}$$

42. A cone has a volume of 128π and radius 8.
Find the height of the cone.

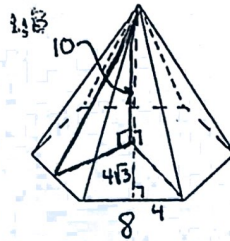
$$\begin{aligned} V_{\text{cone}} &= \frac{1}{3} \pi r^2 h \\ 128\pi &= \frac{1}{3} \pi (8)^2 h \\ 384\pi &= \pi \cdot 64 \cdot h \\ 384 &= 64h \\ \boxed{h} &= \boxed{6} \end{aligned}$$

41. Fill in the missing coordinates.



This shape is a isosceles trapezoid.

This shape is a parallelogram.



Find SA and Vol.

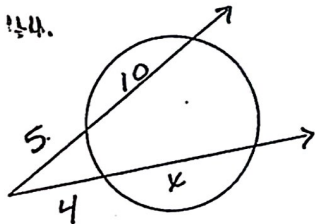
$$\begin{aligned} SA &= \text{Base Area} + 6 \Delta^s \\ &= 96\sqrt{3} + 6 \left(\frac{1}{2} \cdot 8 \cdot \sqrt{48} \right) \\ &= 96\sqrt{3} + 6(4\sqrt{48}) \\ &= 96\sqrt{3} + 24\sqrt{48} \\ &= \boxed{458.25} \end{aligned}$$

$$\begin{aligned} \text{Area Base} &= \frac{1}{2} (a)(P) \\ &= \frac{1}{2} (4\sqrt{3})(48) \\ &= 96\sqrt{3} \end{aligned}$$

$$\begin{aligned} V &= \frac{1}{3} B \cdot h \\ &= \frac{1}{3} (96\sqrt{3})(10) \\ &= 320\sqrt{3} \\ &= \boxed{554.3} \end{aligned}$$

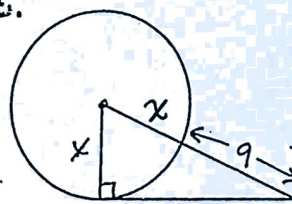
Slant Height: \triangle with hypotenuse 10 and base $4\sqrt{3}$.

$$\begin{aligned} 10^2 + (4\sqrt{3})^2 &= l^2 \\ 100 + 48 &= l^2 \\ \sqrt{148} &= l \end{aligned}$$



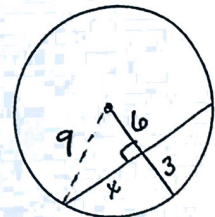
44.

$$\begin{aligned} (15)(5) &= (4+x)(4) \\ 75 &= 16 + 4x \\ \boxed{14.75} &= \boxed{x} \end{aligned}$$



45.

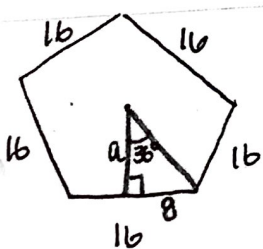
$$\begin{aligned} 15^2 + x^2 &= (9+x)^2 \\ 225 + x^2 &= 81 + 18x + x^2 \\ 225 &= 81 + 18x \\ 144 &= 18x \\ \boxed{8} &= \boxed{x} \end{aligned}$$



46.

$$\begin{aligned} 6^2 + x^2 &= 9^2 \\ 36 + x^2 &= 81 \\ x^2 &= 45 \\ \boxed{x} &= \boxed{\sqrt{45}} \end{aligned}$$

47. Find the area of a regular pentagon with side = 16.



$$\begin{aligned} \tan(36) &= \frac{8}{a} \\ a \cdot \tan(36) &= 8 \\ a &= \frac{8}{\tan(36)} \\ a &= 11.01 \end{aligned}$$

$$\begin{aligned} A &= \frac{1}{2} \cdot a \cdot P \\ &= \frac{1}{2} (11.01)(80) \\ &= \boxed{440.4} \end{aligned}$$