

GEOMETRY Honors: Review for Final Exam

Unit 1 Parallel Lines/Angles

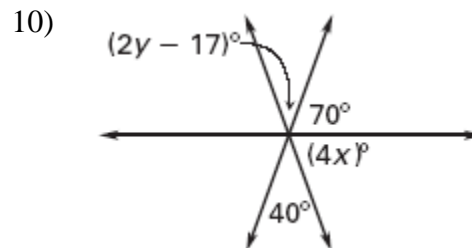
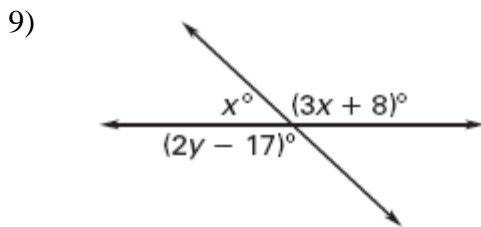
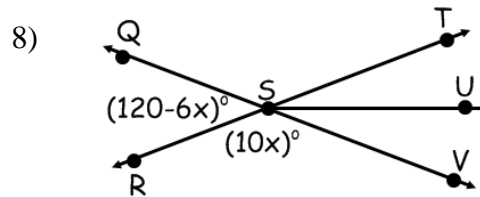
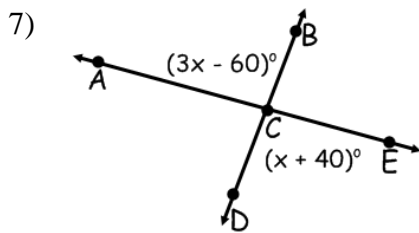
True or False

- 1) ____ Any 2 lines always intersect at one point.
- 2) ____ If \overline{AB} bisects \overline{CD} at point E, then $AE = EB$.

For #3-6, use the following statement: "Linear pairs are supplementary, adjacent angles."

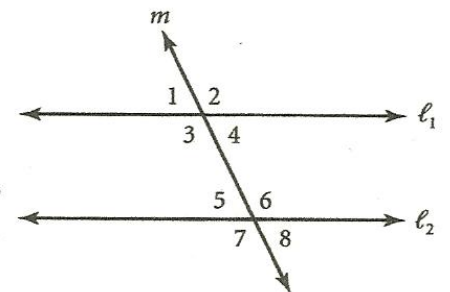
- 3) Rewrite the statement as a conditional.
- 4) Write the converse of the conditional.
- 5) Write the statement as a biconditional.
- 6) Is the statement a definition? Explain your reasoning.

For #7-10, determine the value of the variables in the given diagrams.



#11-13 are multiple choice and use the diagram to the right.

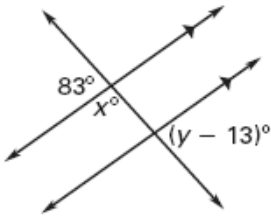
- 11) What type of angles are $\sphericalangle 3$ and $\sphericalangle 6$?
 - a. alternate interior
 - b. alternate exterior
 - c. same-side interior
 - d. corresponding



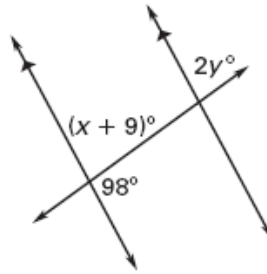
- 12) If $l_1 \parallel l_2$ and $m\angle 1 = 110^\circ$, then determine the equation below that will find the $m\angle 6 =$ (diagram for #11-13)
 - a. $m\angle 6 = 110$
 - b. $m\angle 6 = 2(110)$
 - c. $m\angle 6 + 110 = 180$
 - d. $m\angle 6 + 110 = 360$
- 13) If $l_1 \parallel l_2$ and $m\angle 5 = 75^\circ$, then $m\angle 3 =$
 - a. 15°
 - b. 75°
 - c. 90°
 - d. 105°

Find the value of x and y .

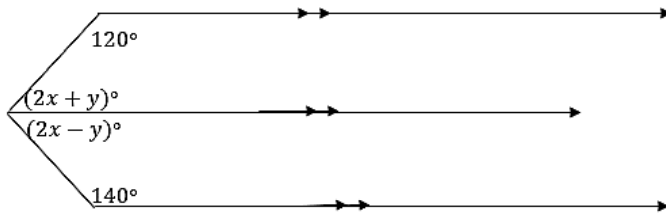
14)



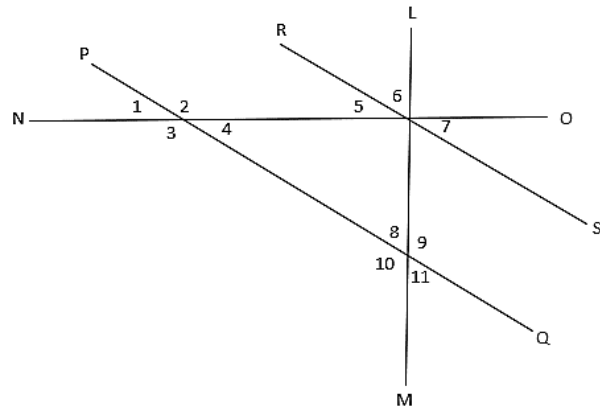
15)



16) Find the values of x and y in the diagram.

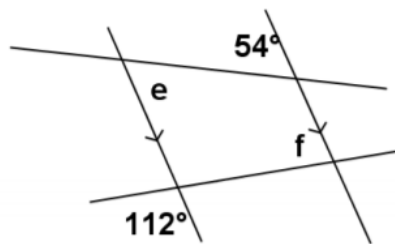


17) Given $\overline{PQ} \parallel \overline{RS}$, $\overline{LM} \perp \overline{NO}$, and the measure of $\angle 2$ is 12° more than three times the measure of $\angle 1$, find the measure of each numbered angle below.

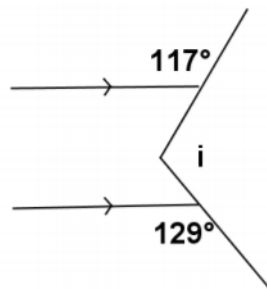


18) Find the value of the variables below.

a.



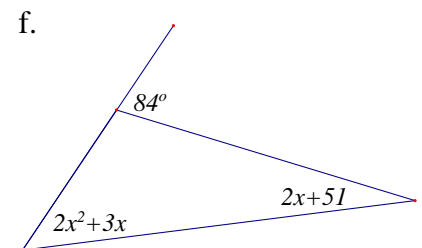
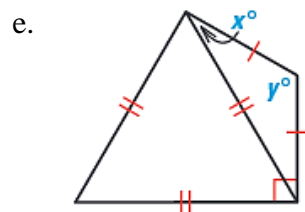
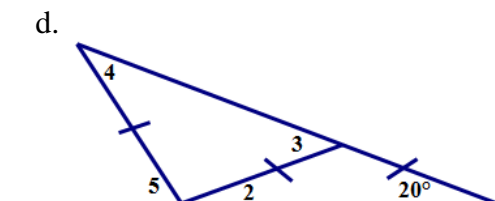
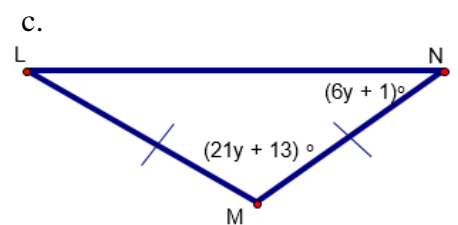
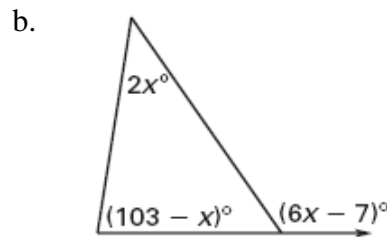
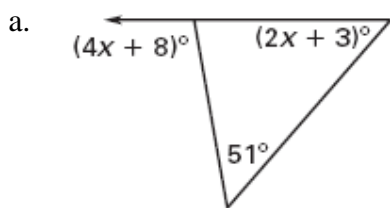
b.

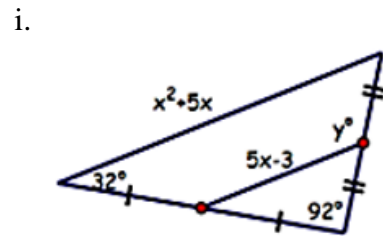
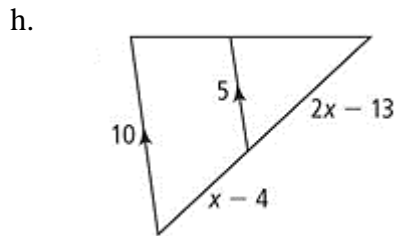
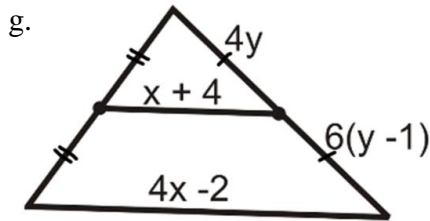


19) Assume that $\angle A$ is supplementary to $\angle B$ and complementary to $\angle C$. Determine $m\angle A$, $m\angle B$, and $m\angle C$ if $m\angle A = (x + 10)^\circ$, $m\angle B = (12x + 1)^\circ$, $m\angle C = (5x + 2)^\circ$.

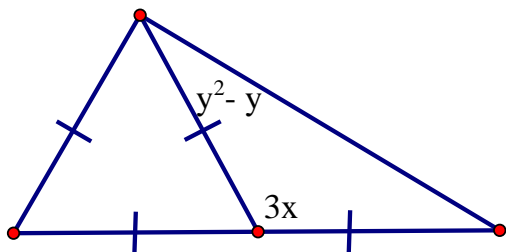
Unit 2 Triangles

- 1) The angles in a triangle are in the extended ratio 2:3:4. Find the measure of each angle.
- 2) \overline{MO} bisects $\angle LMN$. If $m\angle LMO = (x^2 + 4x - 5)^\circ$ and $m\angle LMN = (9x + 5)^\circ$, solve for x and find $m\angle NMO$.
- 3) \overline{YV} is an angle bisector of $\angle XYZ$. Determine $m\angle ZYV$ and $m\angle XYZ$ if $m\angle XYV = 8x - 6$ and $m\angle ZYV = 3x + 8$.
- 4) If C is the midpoint of \overline{AB} find the value(s) of x given $AB = 11x + 10$ and $BC = x^2 + 4x - 5$.
- 5) Can a triangles have sides with the given lengths? Explain.
 - a. 8 cm, 9 cm, 7 cm
 - b. 7 ft, 13 ft, 6 ft
- 6) Solve for the given variable(s) or numbered angles.



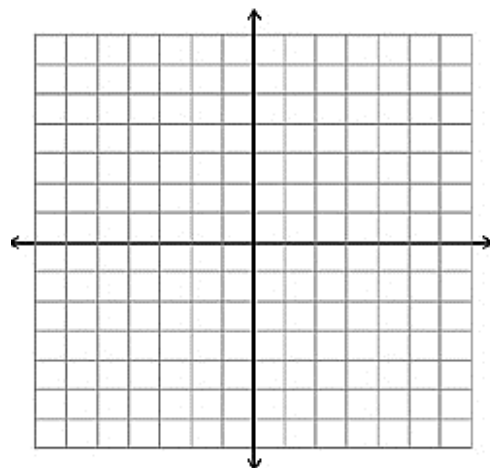


7) Find all possible values of x and y in the problem below.



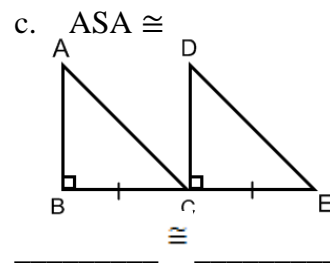
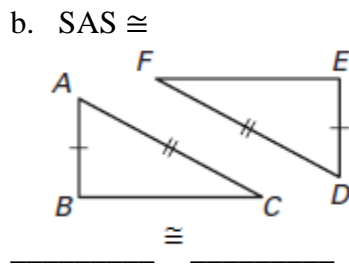
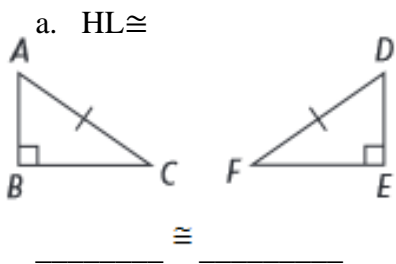
8) \overline{RS} has endpoints $R(2,4)$ and $S(-1,7)$. What is the coordinate of its midpoint M ?

9) The midpoint of \overline{BC} is $(5,-2)$. One endpoint is $B(3,4)$. What are the coordinates of C , the other endpoint?



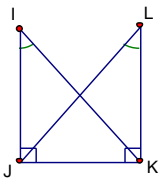
Unit 3 Congruent and Similar Triangles

1) **LABEL AND STATE** the third congruence that is needed to prove the two triangles congruent using the given theorem.

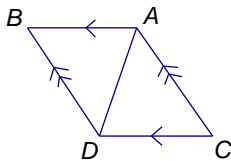


2) Decide whether there is enough information to prove the triangles are congruent. State the postulate or theorem that you would use to prove the triangles congruent.

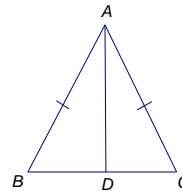
a. $\triangle IKJ \cong \triangle LJK$



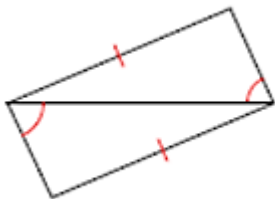
b. $\triangle ABD \cong \triangle DCA$



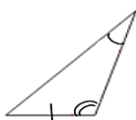
c. $\triangle ABD \cong \triangle ACD$



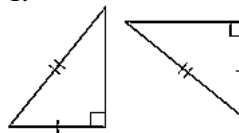
d.



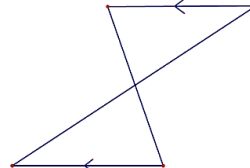
e.



f.



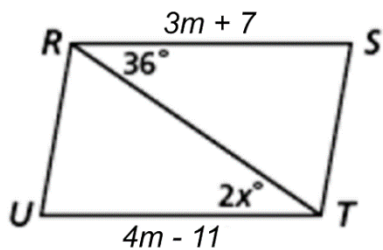
g.



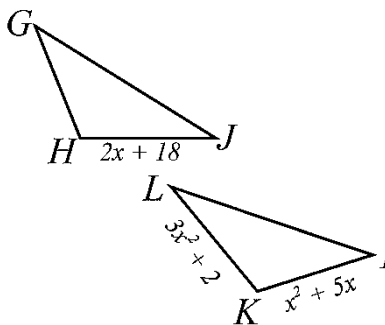
3) $\triangle MAT \cong \triangle WIL$. Find WI , if $AT = 4x^2 + 6x - 10$, $WI = 9x - 6$, and $IL = 2x^2 + 15x + 25$.

4) Find the values of the missing variables, given the following triangle congruence statements. State **why** you can write your equations.

a. $\triangle RST \cong \triangle TUR$



b. $\triangle GHJ \cong \triangle IKL$

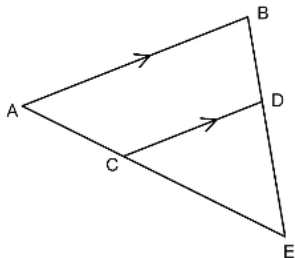


5) Which of the following theorems/postulates is NOT a way to determine if triangles are similar?

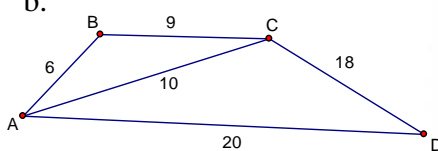
- a. SAS b. SSS c. AA d. SAA

6) Determine whether or not the triangles below are similar by AA~, SSS~, or SAS~, or none of them. Show all work necessary! If they are similar, complete the similarity statement.

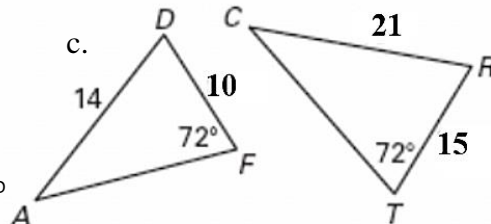
a.



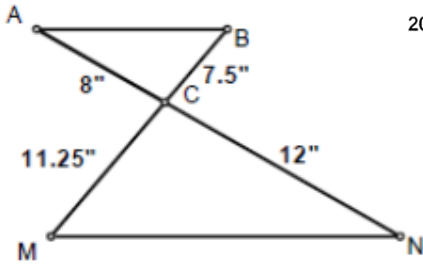
b.



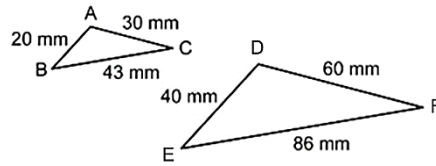
c.



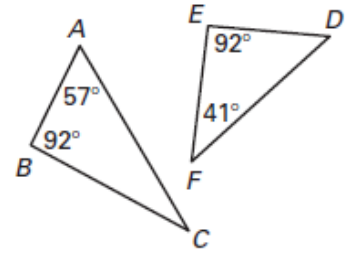
d.



e.



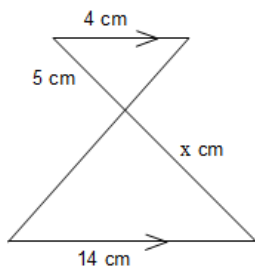
f.



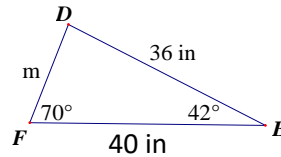
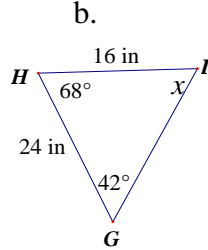
7) Tyler used similar triangles to find the height of a pole. When he stood 6.5 feet from a small puddle, he could see the reflection of the top of the pole in the puddle. The puddle was 26 feet from the pole and Tyler's eye level was 5 feet 6 inches above the ground. What is the height of the pole?

8) Given that the triangles are similar, solve for the missing variables/side lengths and find the scale factor from the smaller figure to the larger.

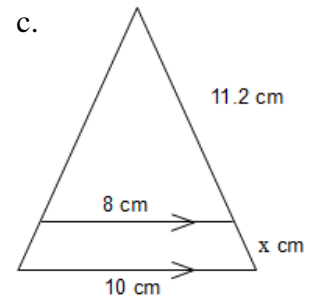
a.



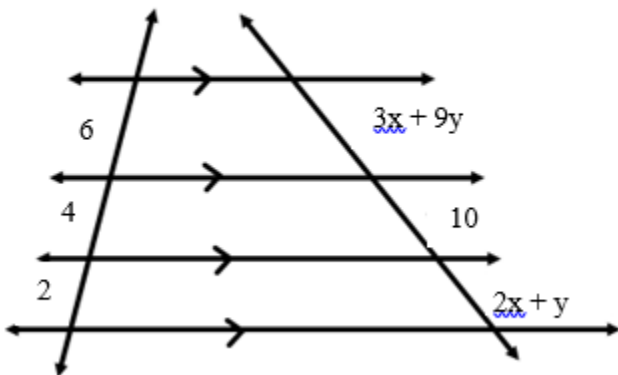
b.



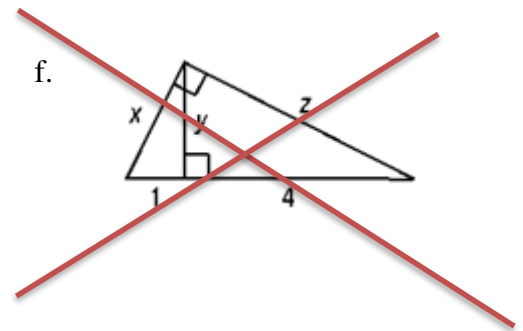
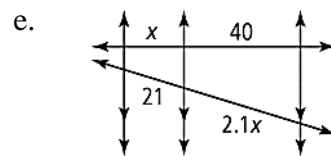
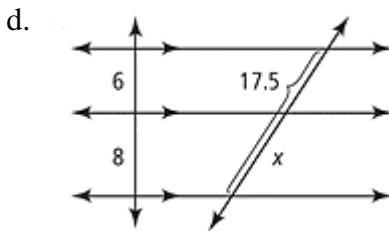
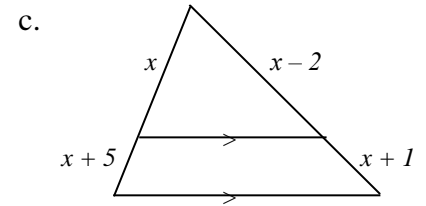
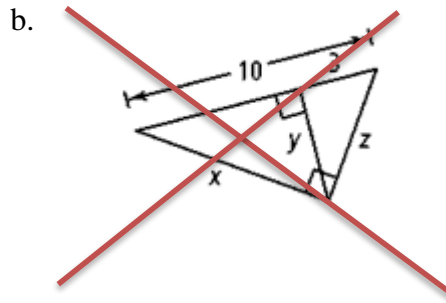
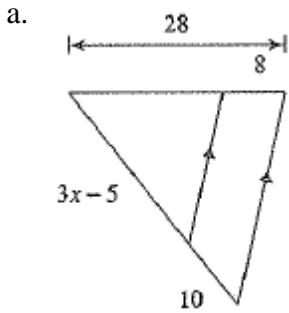
c.



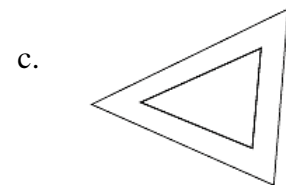
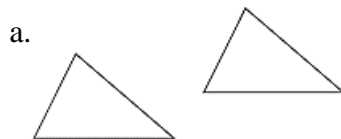
9) Solve for x and y.



10) Solve for the missing variable(s)?.

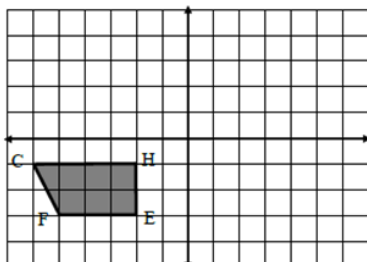


11) Tell what type of TRANSFORMATION is shown in each diagram.

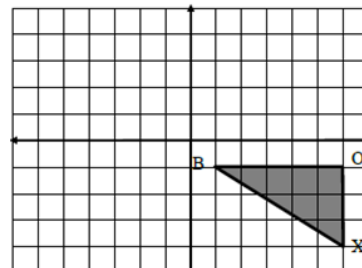


For #12 & 13, list the coordinates of the vertices. Perform each transformation. Then list the coordinates of the new vertices. Finally, write the transformation rule.

12) Rotate about the origin 90 degrees clockwise



13) Translate left 5 and up 3



14) Given the point and its image, determine the scale factor.

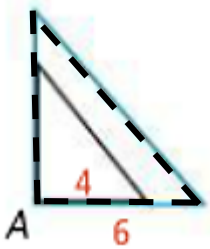
a. $A(3,6)$ $A'(4.5, 9)$

b. $G'(3,6)$ $G(1.5,3)$

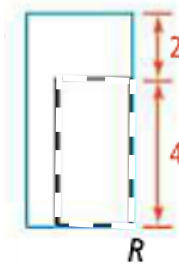
c. $B(2,5)$ $B'(1,2.5)$

15) In the dilation shown, the solid-line figure is the image and the dashed-line figure is the pre-image. State whether the image is an enlargement or reduction, then determine the scale factor.

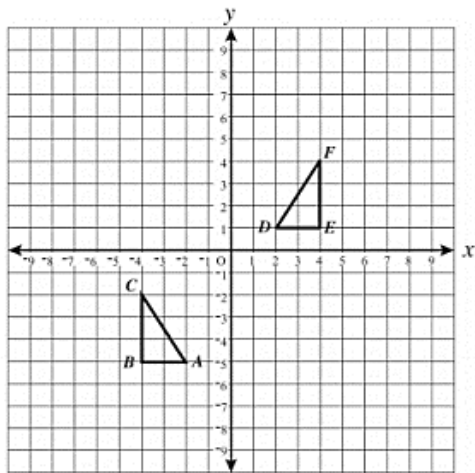
a.



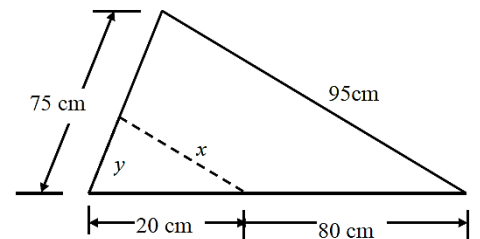
b.



16) Describe a series of transformation that would map $\triangle ABC$ onto $\triangle DEF$. Does the order your transformations take place matter?



17) The dotted figure is the image of the given preimage. Determine the scale factor then calculate the lengths of the missing sides.



18) Find the distance between points C and D. If necessary, round to the nearest tenth. $C(-3, -5)$, $D(-9, 4)$

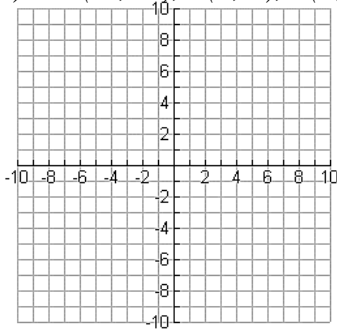
19) Determine whether \overline{AB} and \overline{CD} are parallel, perpendicular or neither. Explain how you know.

a) $A(-1, -3)$, $B(4, 5)$ and $C(0, -2)$, $D(-5, 6)$

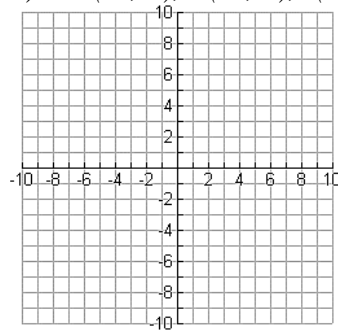
b) $A(-2, -6)$, $B(3, 4)$ and $C(-19, -5)$, $D(-10, 10)$

20) The vertices of a triangle are given. Plot the points on a coordinate plane and determine whether the triangle is a right triangle. Then determine if it is scalene, isosceles or equilateral. Show your work to justify your answer. Write a summary statement explaining your conclusion.

a) $X(-2, -1), Y(0, 2), Z(3, -1)$

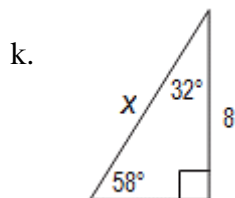
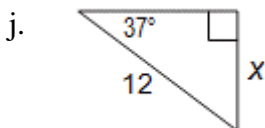
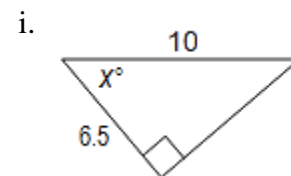
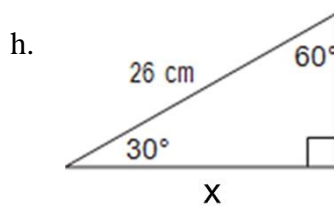
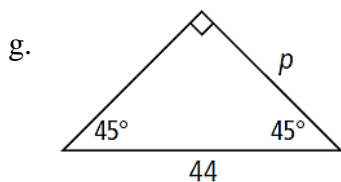
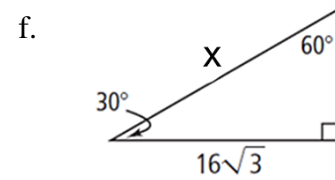
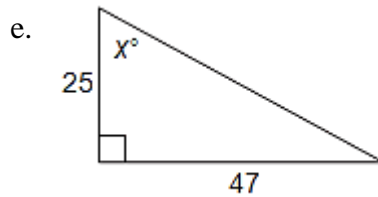
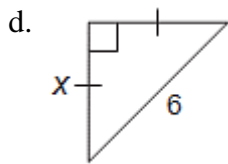
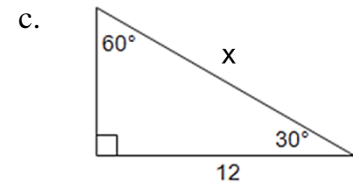
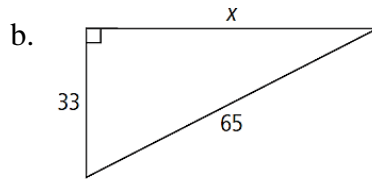
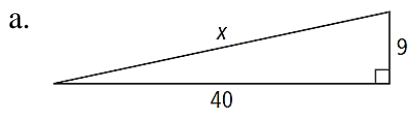


b) $T(-3, 4), R(-1, 0), I(1, 6)$



Unit 4 Solving Right Triangles

1) Find the value of the missing variables below. Round side lengths to the nearest hundredth and angle measures to the nearest degree. If it is a special right – leave your side lengths in simplest radical form.



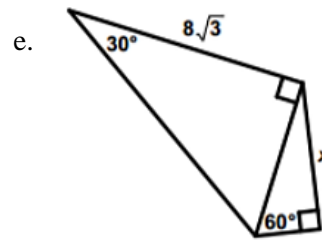
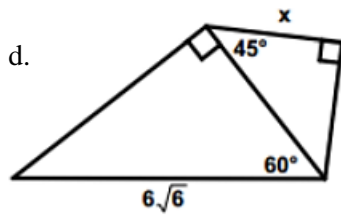
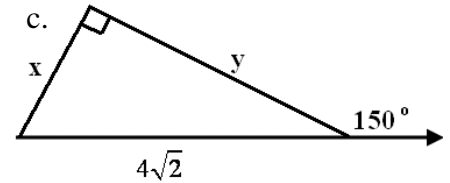
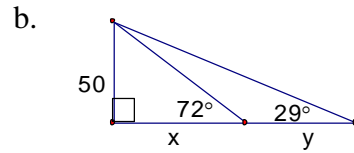
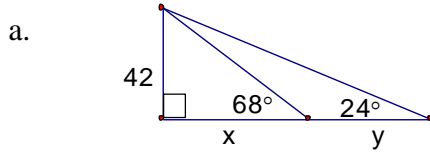
2) The lengths of the sides of a triangle are given. Classify each triangle as *acute*, *right*, or *obtuse*.

a. 50, 14, 48

b. 4, 9, 8

c. $2\sqrt{3}$, 4, 6

3) Find the value of the missing variables.



4) The hypotenuse of a $30-60-90$ triangle is $12\sqrt{2}$ ft. Find the area of the triangle.

5) Find the perimeter and area of an equilateral triangle with height 30 yards.

6) A lighthouse is 32 feet tall and someone at the top of the lighthouse sees a boat that needs help. The angle of depression from the top of the lighthouse is 19° . Assuming the lighthouse is directly on the water, how far will the person have to row to get to the boat to help them?

7) An engineer stands 50 feet away from a building and sights the top of the building with a surveying device mounted on a tripod that is 5 feet tall. If the angle of elevation is 50° , how tall is the building?

8) A ladder is leaning up against the side of a house. The angle between the ground and the ladder is four times as big as the angle between the house and the ladder.

1) What are the angles?

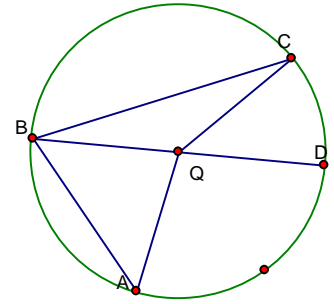
2) How long is the ladder if it is 5 feet from the house at ground level?

- 9) A wire attached to the top of a pole reaches a stake in the ground 20 feet from the foot of the pole and makes an angle of 58° with the ground. Find the length of the wire.

Unit 5 Circles

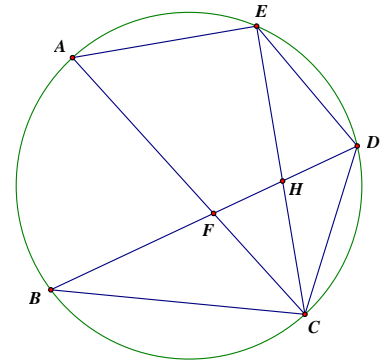
- 1) Given $\odot Q$, $m\angle ABC = 72^\circ$ and $m\widehat{CD} = 46^\circ$. \overline{BD} is a diameter. Find the indicated measures.

- a. $m\widehat{CA} = \underline{\hspace{2cm}}$ b. $m\widehat{BC} = \underline{\hspace{2cm}}$
 c. $m\widehat{AD} = \underline{\hspace{2cm}}$ d. $m\angle C = \underline{\hspace{2cm}}$
 e. $m\angle ABD = \underline{\hspace{2cm}}$ f. $m\angle A = \underline{\hspace{2cm}}$



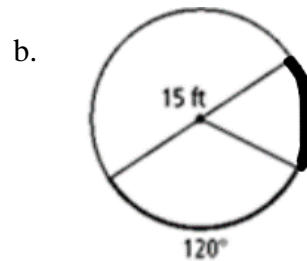
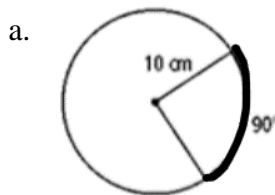
- 2) In the circle to the right, $m\angle CAE = 60^\circ$, $m\widehat{BC} = (10x - 36)^\circ$, $m\widehat{BA} = (8x)^\circ$, $m\widehat{AE} = (4x + 12)^\circ$, and $\overline{DE} \cong \overline{DC}$. Find each of the following.

- a. $x = \underline{\hspace{2cm}}$ b. $m\angle BDE = \underline{\hspace{2cm}}$
 c. $m\widehat{ECA} = \underline{\hspace{2cm}}$ d. $m\widehat{CD} = \underline{\hspace{2cm}}$

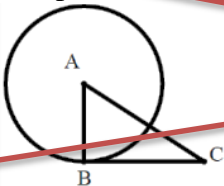


- 3) If the radius of a circle is 22 mm and the degree measure of one of the arcs on the circle is 160° , find the length of the arc. Write your answer in exact, simplified terms.

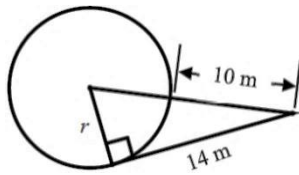
- 4) Find the length of each darkened arc. Leave answers in terms of pi.



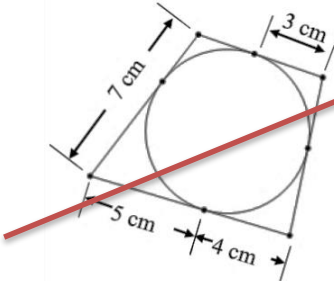
- 5) B is a point of tangency. If $m\angle C = 30^\circ$ and $AC = 40$, then what is the length of the radius?



6) Find the length of the radius.

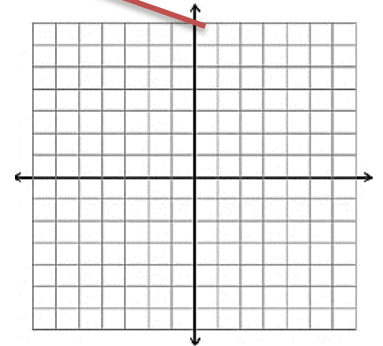


7) Find the perimeter of the quadrilateral below. The circle is inscribed in the quadrilateral.



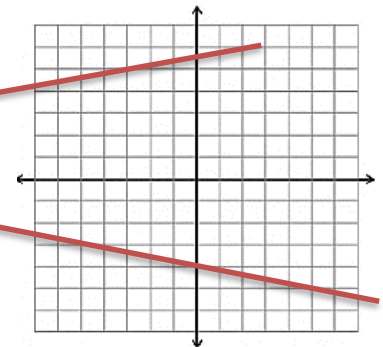
8) Write an equation in standard form for each circle. Then, give its center and radius. Then graph the circle.

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



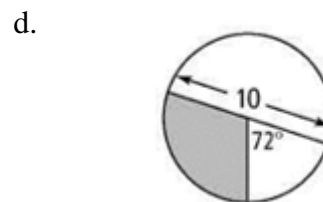
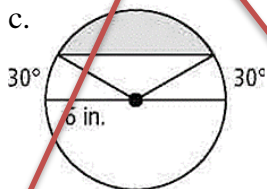
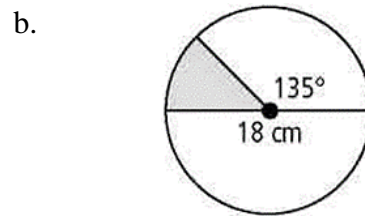
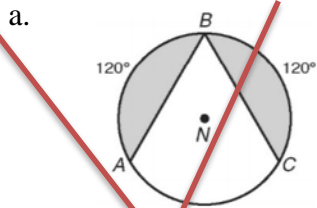
9) Write an equation in standard form for each circle. Then, give its center and radius. Then graph the circle.

$$x^2 - 24x + y^2 + 140 = -6y + 3$$

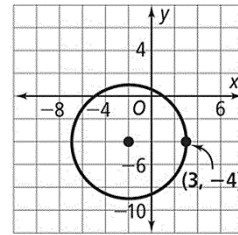


10) Find the area of the shaded region. A-C: Round your answer to the nearest hundredth, D-F: keep your answers in simplified radical form.

Circumference = 16π

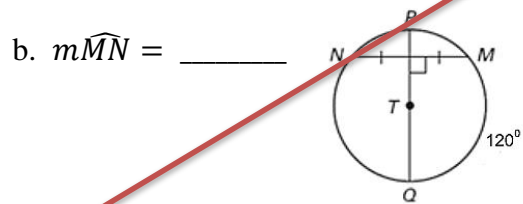
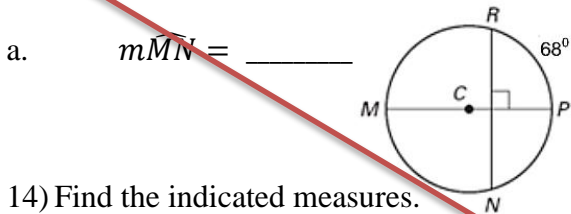


11) Write the standard equation of the circle in the diagram at the right.



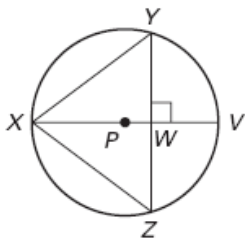
12) What is the standard equation of the circle with center (8, -2) that passes through the point (1, 4)?

13) Find the measure of $m\widehat{MN}$. \overline{MP} and \overline{QP} are diameters.

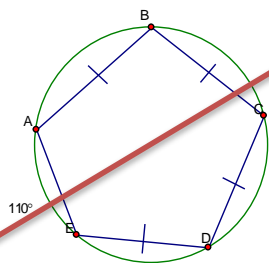


14) Find the indicated measures.

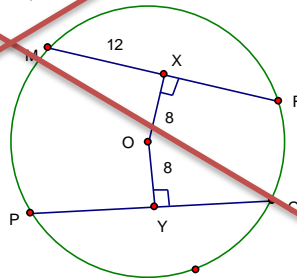
a. In $\odot P$, $ZY = 12$, $XW = 10$



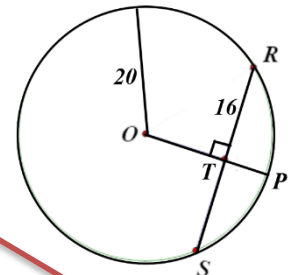
b.



c. (O is the center of the circle)



d. (O is the center of the circle)



a. $XY = \underline{\hspace{2cm}}$ b. $m\widehat{BD} = \underline{\hspace{2cm}}$

c. $OQ = \underline{\hspace{2cm}}$

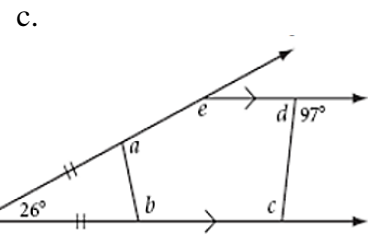
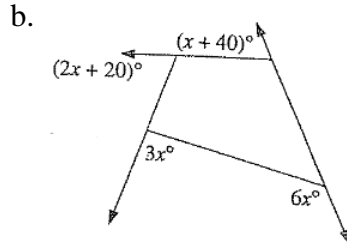
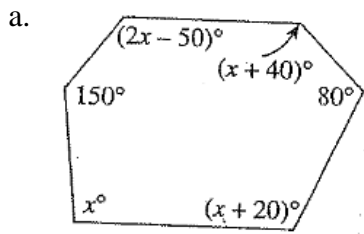
d. $PT = \underline{\hspace{2cm}}$

$m\widehat{RS} = \underline{\hspace{2cm}}$

Unit 6 Polygons and Quadrilaterals

- 1) What is the sum of the measures of the interior angles of a hexagon?
- 2) If the measure of an exterior angle of a regular polygon is 18° , how many sides does the polygon have?
- 3) The measure of an interior angle of a regular polygon is 140° . How many sides does it have?
- 4) The measure of an interior angle of a regular polygon is four times the measure of its exterior angle. How many sides does the polygon have?
- 5) If each interior angle on a regular polygon has a measure of 168° , how many sides will the polygon have?

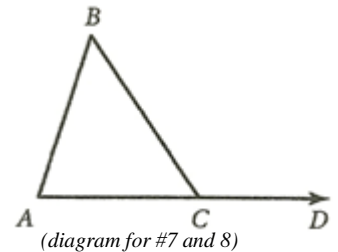
6) Find the value of the missing variables.



7) If $m\angle A = x + 5$, $m\angle B = x$, and $m\angle BCD = 125^\circ$, then $m\angle A =$

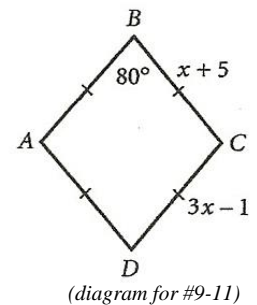
8) If $\overline{AC} \cong \overline{BC}$ and $m\angle BCD = 108^\circ$, then $m\angle A =$

9) What type of quadrilateral is $ABCD$? Why? Be specific

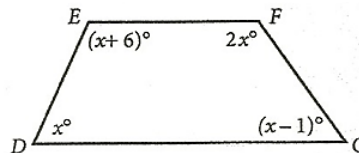


10) What is the length of side \overline{AB} ? State a property that supports your answer.

11) What is the measure of $\angle A$? State a property that supports your answer.



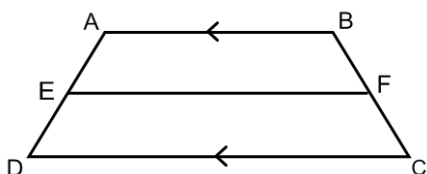
12) What is $m\angle G$ in quadrilateral $DEFG$?



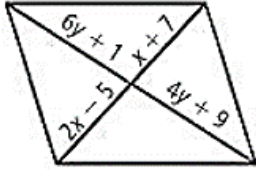
13) Determine whether each statement is Sometimes, Always, or Never true. Justify each sometimes answer.

- If a figure is a parallelogram, then it can be a trapezoid.
- A square is a rhombus.
- A rectangle is a square.
- If a figure is a quadrilateral, then it has all right angles.
- The diagonals of a square are perpendicular.

14) \overline{EF} is the midsegment of trapezoid $ABCD$. If $AB = x^2 + 3x + 7$, $DC = x^2 + 6$, and $EF = 7x - 1$, determine the length of EF .



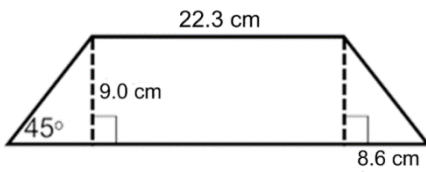
- 15) The quadrilateral below is a parallelogram. Find the values of x and y . State a property that supports your equations.



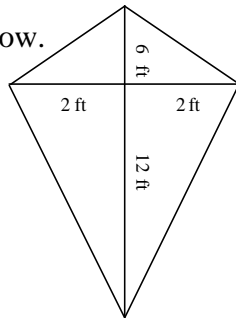
- 16) Quadrilateral $ABCD$ is a parallelogram. If $AB = 2x^2 - 13x$, $CD = 24$, $m\angle D = (10y - 4)^\circ$, and $m\angle A = (4y + 2)^\circ$, find all possible values of x and y . State a property that supports your equations.

- 17) If rectangle $JKLM$ has $MK = 3x - 5$, $JL = 2y + 5$, $KL = x + 5$, and $JM = 4y - 5$. Find JL and KL . State a property that supports your equation.

- 18) Find the area of the trapezoid below. Round your answer to the nearest tenth.



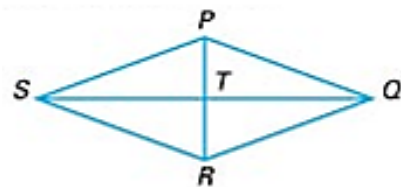
- 19) Find the area of the kite below.



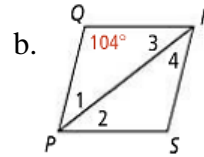
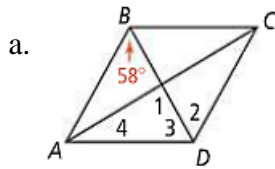
- 20) $RHOM$ is a rhombus. If $m\angle RHM = (2x^2 - 10x - 60)^\circ$, $m\angle RMO = (x^2 + 9x - 110)^\circ$, find $m\angle MRH$. State a property that supports your equation.

- 21) Given that $PQRS$ is a rhombus, $PQ = 5$, $PR = 6$, $ST = 4$, $m\angle PQR = 74^\circ$, find the following:

- | | |
|------------------|------------------|
| a. QR | b. TR |
| c. PT | d. SQ |
| e. $m\angle QPS$ | f. $m\angle PTQ$ |
| g. $m\angle QPT$ | h. $m\angle PSR$ |

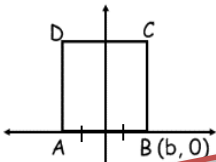


22) Find the measures of the numbered angles in each rhombus below.

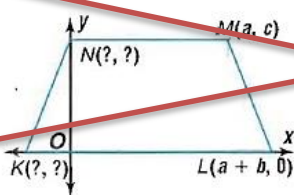


23) Determine the missing coordinates in each figure below.

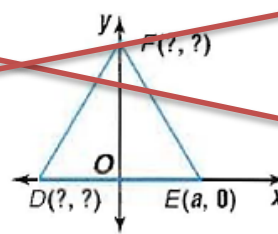
a. square $ABCD$



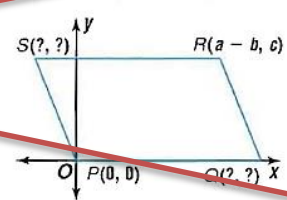
b. isosceles trapezoid $KLMN$



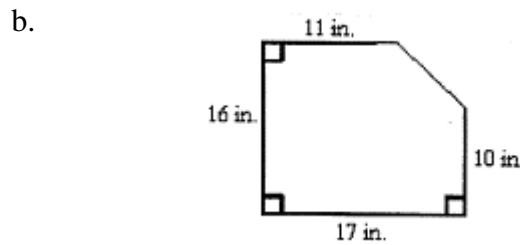
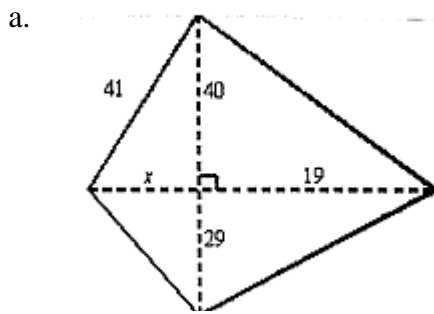
c. isosceles triangle DEF



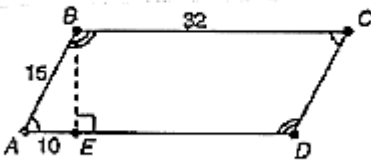
d. parallelogram $QRST$



24) Find the area of the figures below.

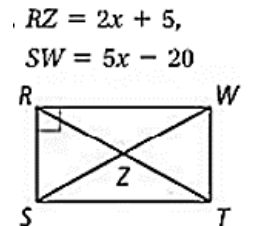


25) Find the area of the parallelogram $ABCD$. Leave answer in exact form (simplified square root).



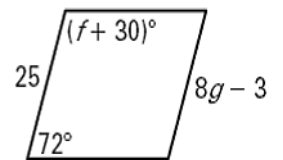
26) Determine the equation that will find the value for x in the parallelogram at right.

- A. $2x + 5 = 90$
- B. $2x + 5 = 5x - 20$
- C. $2(2x + 5) = 5x - 20$
- D. $2(2x + 5) = 2(5x - 20)$



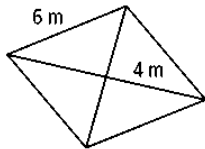
27) Determine the equation that will find the value for f in the parallelogram at right.

- A. $f + 30 = 72$
- B. $f + 30 = 2(72)$
- C. $f + 30 + 72 = 180$
- D. $f + 30 + 72 = 360$



28) In rhombus $ABCD$, $AB = 16$ and $AC = 28$. Find the area of the rhombus to the nearest tenth

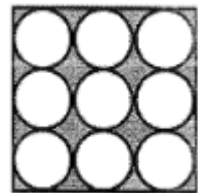
29) Find the area of the rhombus below.



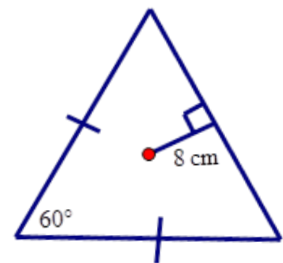
30) Find the area of an octagon whose side length is 14 in .

31) Determine the area of an equilateral triangle whose side length is 14 in . Leave answer in simplified square roots if necessary.

32) In the figure, each circle has a radius of 2 inches . What is the area of the shaded region rounded to the nearest hundredth?

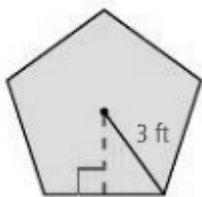


33) Find the area of the triangle if the length of the apothem is 8 cm .

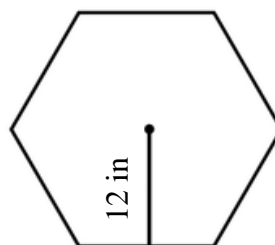


34) Find the area of the regular polygons below. Round your answer to the nearest tenth.

a.

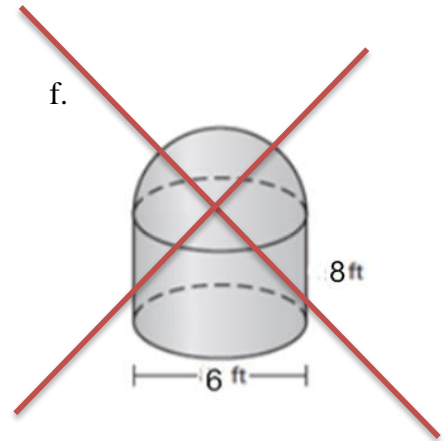
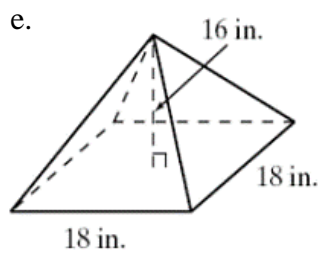
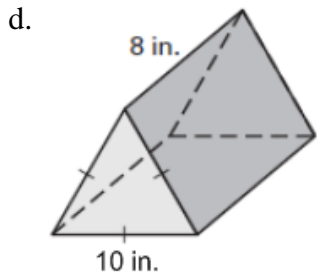
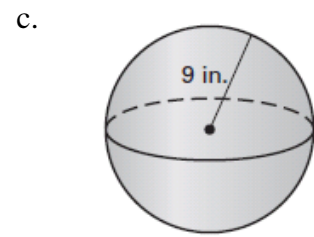
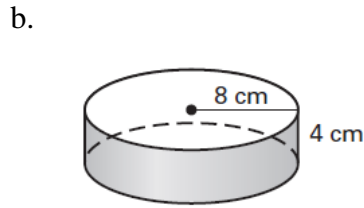
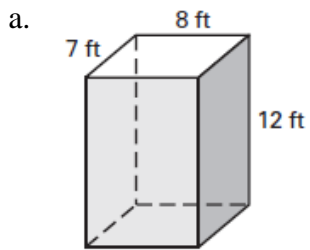


b.



Unit 7 Surface Area and Volume

1) For the following find the surface area and volume of the solid. Give an exact, simplified answer.



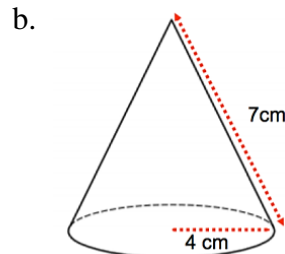
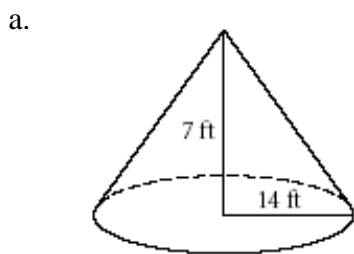
2) For the following, determine the unknown value for a right cylinder with the given radius, r , height, h , surface area SA , and volume, V .

a. $r = 26'$, $h = 16'$ $SA = \underline{\hspace{2cm}}$

b. $V = 144\pi \text{ cm}^3$, $r = 12 \text{ cm}$ $h = \underline{\hspace{2cm}}$

c. $V = 80 \text{ in}^3$, $h = 16 \text{ in}$ $r = \underline{\hspace{2cm}}$

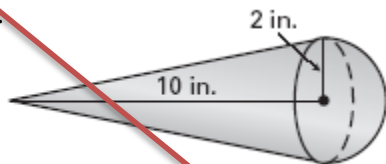
3) For the following, determine the surface area and volume of each right cone.



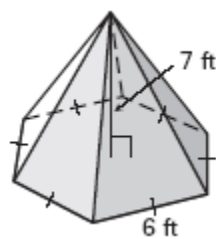
- 4) A right cone has a surface area of 152π square meters. The radius is 8 m. Determine the slant height.
- 5) The volume of a right cone is 27π cubic inches. The height is the same as the radius. Determine the surface area of the cone to the nearest hundredth.
- 6) Determine the surface area of a sphere with a diameter of 4". Leave answer in terms of π .
- 7) Determine the length of a radius if the surface area of a sphere is $36\pi \text{ cm}^2$.
- 8) Determine the volume of a sphere with a radius of 14 cm.
- 9) The volume of a sphere is $7776\pi \text{ ft}^3$. Find the surface area in terms of π .
- 10) Determine the volume of a sphere (in terms of π) if the surface area is $100\pi \text{ cm}^2$

11) For the following, determine the surface area and volume of each figure. Write answers in exact form and rounded to the nearest hundredth.

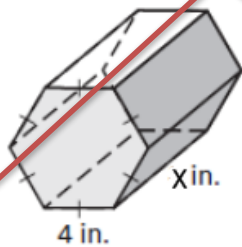
a.



b.



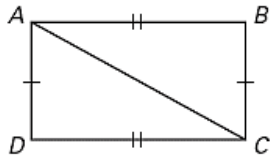
12) Find the volume of the prism below in terms of x .



Proofs

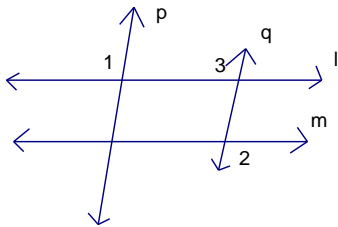
1) **Given:** $\overline{AD} \cong \overline{BC}$; $\overline{AB} \cong \overline{DC}$

Prove: $\overline{AD} \parallel \overline{BC}$



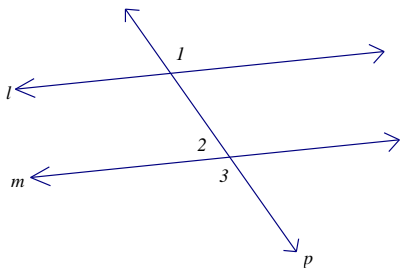
2) **Given:** $p \parallel q$; $\angle 1 \cong \angle 2$

Prove: $l \parallel m$



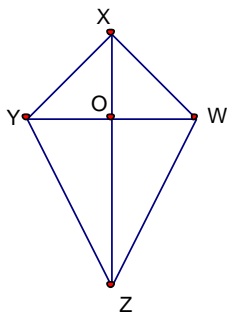
3) **Given:** $l \parallel m$

Prove: $\angle 1$ and $\angle 2$ are supplementary



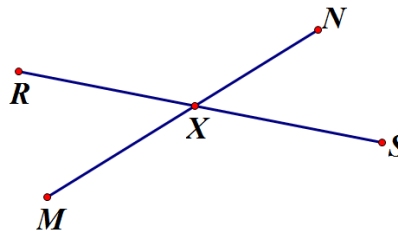
4) **Given:** $\overline{XY} \cong \overline{XW}$, \overline{XZ} bisects $\angle YXW$

Prove: $\triangle ZYX \cong \triangle ZWX$



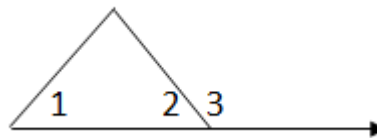
5) **Given:** X is the midpoint of \overline{MN} ; $MX = RX$

Prove: $XN = RX$



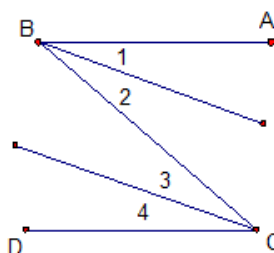
6) **Given:** $m\angle 1 + m\angle 3 = 180$

Prove: $\angle 1 \cong \angle 2$



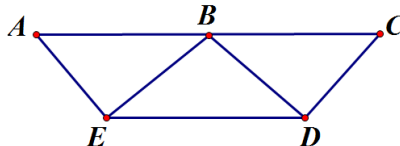
7) **Given:** $\angle 1 \cong \angle 3$, $\angle 2 \cong \angle 4$

Prove: $\angle ABC \cong \angle BCD$



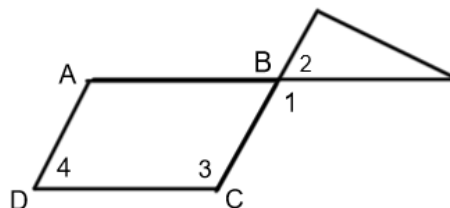
8) **Given:** $\overline{AE} \perp \overline{BE}$, $\overline{CD} \perp \overline{BD}$, $\overline{AC} \parallel \overline{ED}$, $\angle BED \cong \angle BDE$

Prove: B is the midpoint of \overline{AC}



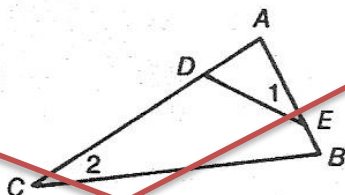
9) **Given:** $\angle 2$ is supplementary to $\angle 3$; $\overline{AD} \parallel \overline{BC}$

Prove: $m\angle 1 + m\angle 4 = 180$



10) **Given:** $\angle 1 \cong \angle 2$

Prove: $\frac{AD}{AB} = \frac{AE}{AC}$



11) **Given:** $\angle C$ and $\angle B$ are right angles , $\angle EFB \cong \angle EGC$

Prove: $\triangle ABG \sim \triangle DCF$

