Chapter 7 Proportional Reasoning and Similarity

2ND SEM/Q4 EXAM REV
Ch 7-11

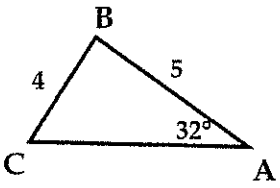
Similar Figures:_____

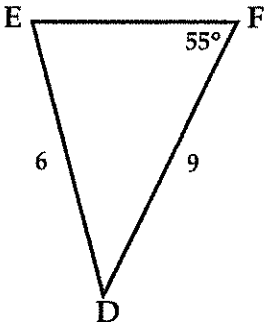
"Candy Bar" Method:

Typical Diagrams:

1. $\Delta ABC \sim \Delta DEF$

   A. Find EF._____
   B. Find m∠E._____
   C. Find perimeter of ΔABC._____

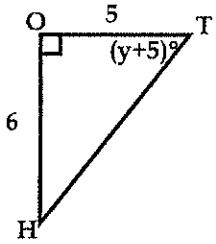


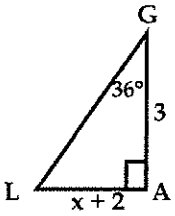


2. $\Delta HOT \sim \Delta GAL$

   A. Find x._____

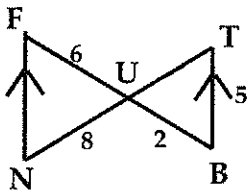
   B. Find y._____



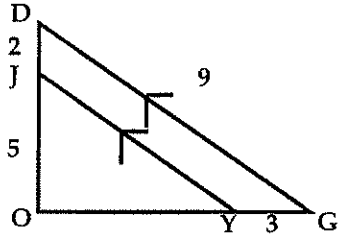


3. An 18-inch segment is divided into the ratio of 2:3. Find the length of the two parts.

4. Complete: $\Delta FUN \sim$ _____
   Find the length of UT_____FN_____



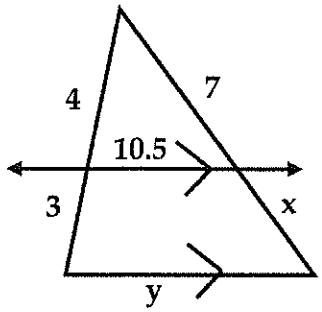
5. Complete: $\Delta JOY \sim$_____
   Find the length of JY_____ OG_____



Answers
1. 4.8, 93°, 16.5
2. x=0.5, y=49
3. 7.2 & 10.8
4. ΔBUT, $UT=2\frac{2}{3}$, FN=15
5. ΔDOG, JY=6.4, OG=10.5

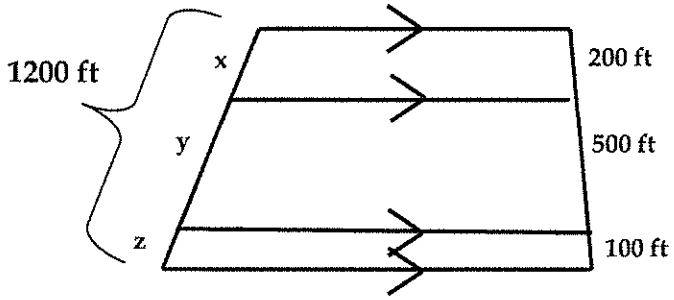
6. Find the length of x and y.

x = _____ y = _____



7. Find the length of x, y and z.

x = _____ y=_____ z=_____



8. A triangle has a perimeter of 159 inches. One side of the triangle is 61 inches and the other two sides are divided into a ratio of 3:4. Find the missing sides.

9. An rectangle has a perimeter of 112 meters. The base and height are in the ratio of 5:2. Find the base, the height, and the area of the rectangle.

Answers
6. x=5.25, y=18.375
7. x=300, y=750,z=150
8. 42 in & 56 in
9. b=40m, h=16m, A =640 m^2
10. 6 ft
11. 23 coupons

10. A fountain casts a shadow that is 24 feet long at the same time a child who is 4 feet 6 inches tall casts a shadow 18 feet. To the nearest inch, how tall is the fountain?

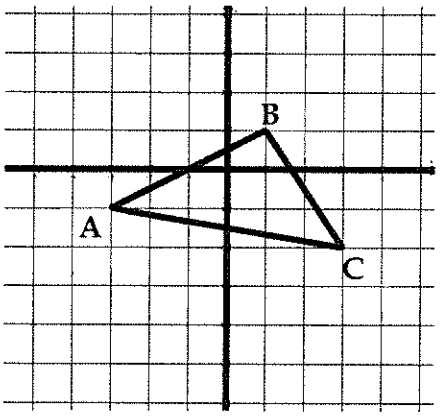
11. BC Pizza donated 80 coupons for free pizza to be distributed proportionally among the freshman, sophomore, junior, and senior classes. The following table shows the number of students per grade level. To the nearest whole, how many coupons should be given to the junior class?

Fresh	Soph	Juniors	Seniors
250	275	310	242

Chapter 7 Dilations

PreImage • k = Image	Dilation in Coordinate Plane
	If center = origin, then _____
	If center is vertex of figure, then _____

1. ΔABC is shown on the coordinate plane.
A dilation of 3 centered at the origin produces $\Delta A'B'C'$.
What is the length of $A'B'$?_____



Answers
1. $A'B' = 6\sqrt{5}$
2. a. enlg, no rot
   b. red, no rot
   c. enlg, 180° rot
   d. enlg, no rot
   e. ≅, 180° rot
3. k = 4/3, $9\frac{1}{3}$, 11.25
4. k = -2, (6, -10), (2, -8)
5. A. k = 2.25
   B. k = 5
   C. k = ¼
   D. k= 2

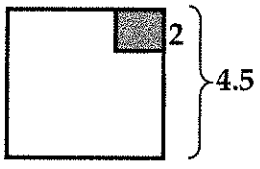
2. Circle the effects of the dilation with the following scale factor?

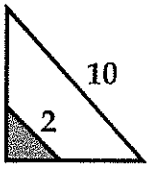
A.	$k = 2$	Reduction	Enlargement	≅	Rotation 180°	No rotation
B.	$k = 1/3$	Reduction	Enlargement	≅	Rotation 180°	No rotation
C.	$k = -4$	Reduction	Enlargement	≅	Rotation 180°	No rotation
D.	$k = 5/4$	Reduction	Enlargement	≅	Rotation 180°	No rotation
E.	$k = -1$	Reduction	Enlargement	≅	Rotation 180°	No rotation

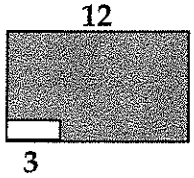
3. A dilation maps ΔDEF onto $\Delta D'E'F'$. If DE = 7 ft, EF = 9ft, D'F' = 15, and E'F' = 12 ft, find:
Scale factor k = _____ D'E' _____ DF _____

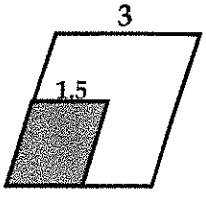
4. A dilation maps ΔGHI with coordinates of G (- 3, 5) H(2, -3) I (-1, 4) produces $\Delta G'H'I'$ with coordinates H'(- 4, 6). Find the scale factor k = _____ G' _____ I'_____

5. The shaded figure (preimage) is dilated. Find the scale factor of each.

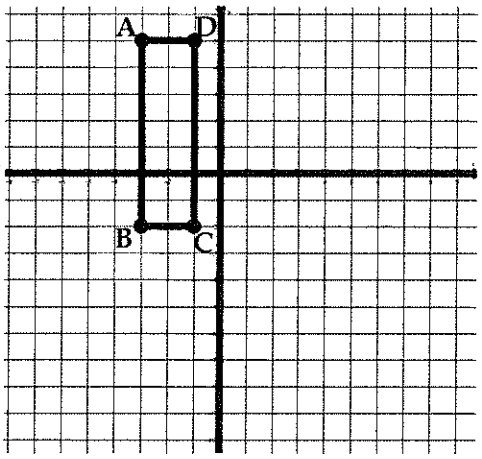
A. 

B. 

C. 

D. 

Quadrilateral ABCD has coordinates A(-3, 5) B(- 3, -2), C (-1, -2) and D(-1, 5).



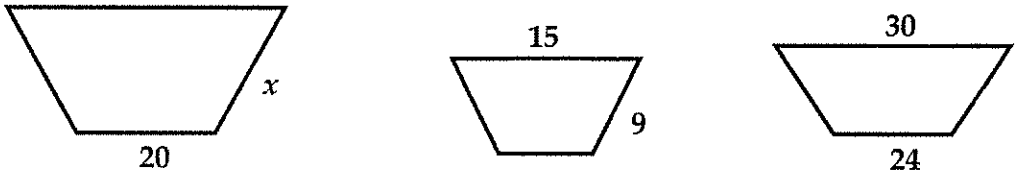
6. If ABCD is dilated <u>about the origin</u> by a scale factor of -3, find the coordinates of the image.

   A′_____ B′_____ C′_____ D′_____

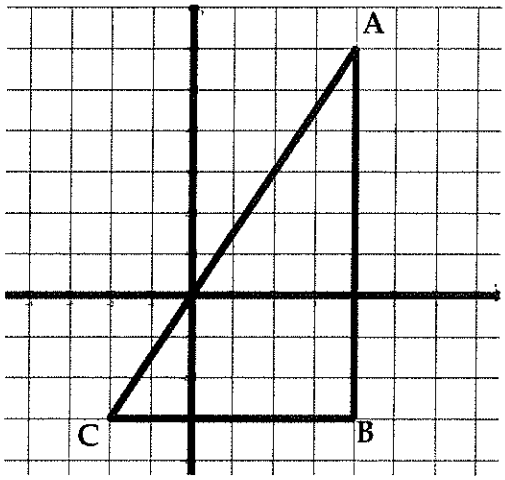
7. If ABCD is dilated <u>about the center (-3, 5)</u> by a scale factor of 1.5, find the coordinates of the image.

   A′_____ B′_____ C′_____ D′_____

8. Sarah drew three similar quadrilaterals as shown. What is the length of side x? _____



ΔABC has coordinates A(4, 6) B(4, -3), and C (-2, -3).



9. If ABCD is dilated <u>about the origin</u> by a scale factor of ½ , find the coordinates of the image.

   A′_____ B′_____ C′_____

10. If ABCD is dilated <u>about the center (4, -3)</u> by a scale factor of 2/3, find the coordinates of the image.

    A′_____ B′_____ C′_____

<u>Answers</u>
6. A′(9, -15), B′(9,6), C′(3,6), D′(3, -15)
7. A′(-3,5), B′(-3, -5.5), C′(0, -5.5), D′(0,5)
8. 15
9. A′(2,3), B′(2, -1.5), C′(-1, -1.5)
10. A′(4,3), B′(4, -3), C′(0, -3)

Chapter 8 Review – Trigonometry

Pythagorean Theorem: sin ∠ = cos∠ = tan∠=

Converse of Pythagorean Theorem:

45°-45°-90°: Law of Sines

30°-60°-90°: Angle of Elevation/Depression:

1. The perimeter of a square is 64 inches. What is the length of the diagonal?_____

2. The diagonal of a square is 10 inches. Find the perimeter._____

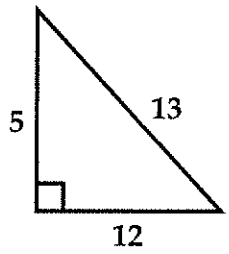
3. The longer leg of a 30°-60°-90° triangle is 21. Find the length of the perimeter. _____

4. Determine if the following triangles are acute, obtuse, or right.
   A. 30 cm, 30 cm, 30 cm _____
   B. 30 cm, 40 cm, 50 cm _____
   C. 30 cm, 60 cm, 80 cm _____
   D. 30 cm, 31 cm, 32 cm _____

5. In ΔPQR, ∠Q is a right angle. If tan R = 8/15, find cos P._____

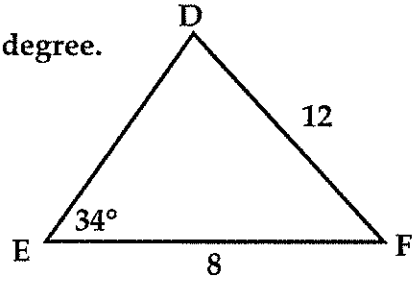
Answers
1. $16\sqrt{2}$
2. $20\sqrt{2}$
3. $21\sqrt{3} + 21$
4. acute, rt, obt, acute
5. 8/17

6. Find the smallest angle of right ΔABC. (nearest tenth)

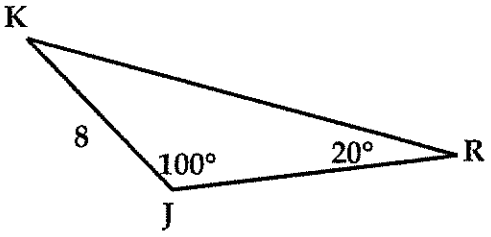


Answers
6. 22.6°
7. m∠D=22°
8. per=51.3
9. alt=6.5√3 in
10. h=15 ft, A=135 ft², diag=3√34 ft
11. √5
12. 6√2

7. Given ΔDEF. Find m∠D to the nearest degree.



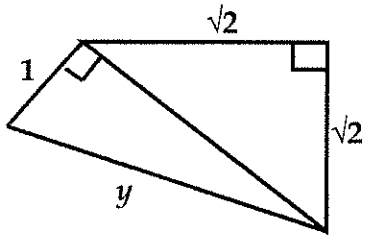
8. Find the perimeter of ΔJKR to the nearest tenth.



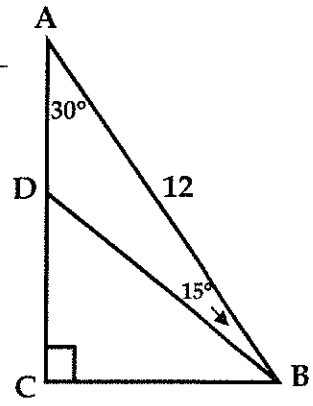
9. Find the length of the altitude of an equilateral triangle with perimeter of 39 inches.

10. A rectangle has a perimeter of 48 ft. The base is 9.
Find the height_____ area_____ and length of the diagonal _____.

11. Find y_____



12. Find DB_____



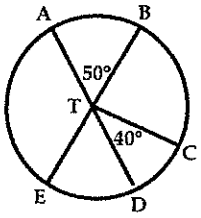
Chapter 11 Exam Review – Circles

Central ∠:	Inscribed ∠:
Eq of Circle:	Tangent:
Length of an arc:	Area of sector:

1. A circle is divided into 8 equal sectors. If the area of one sector is 18π. What is the EXACT arc length of one sector?_____

2. A circle is divided into 12 equal sectors. The arc length of one sector is 3π. What is the EXACT area of one sector?_____

3. Find the measure of the following arcs in circle T.

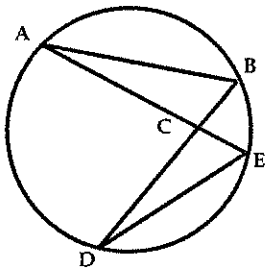


   A. $m\widehat{BC}$ _____
   B. $m\widehat{BAD}$_____
   C. $m\widehat{AC}$ _____
   D. Probability of spinner landing on sector formed by ∠ATE. _____

4. If EB = 9, find the length of $\widehat{AB}$.

5. If EB = 9, find the area of the sector formed by ∠ATC.

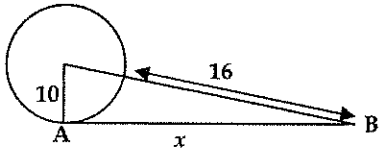
6. In the circle below, if $m\widehat{AB} = 116°$, $m\widehat{BE} = 48°$, and $m\widehat{ED} = 72°$, find the following.
   a. m∠BAE _____
   b. m∠ABD _____
   c. m∠BCA _____



7. Suppose the diameter of a circle is 20 in long and a chord is 16 inches long. Find the distance from the center of the circle to the chord.

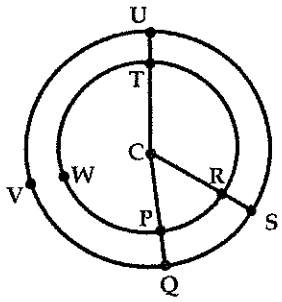
8. Suppose a chord of a circle is 9 in long and its midpoint is 6 inches from the center of the circle. Find the length of the radius.

9. In the diagram below, $\overline{AB}$ is tangent to the circle. Find x._____



Answers
1. 3π
2. 27π
3. 90°, 230°, 140°, $\frac{13}{36}$
4. 3.9
5. 24.7
6. 24°, 62°, 94°
7. 6 in
8. 7.5 in
9. 24

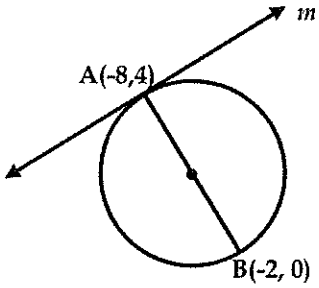
10. In circle C, m∠SCQ = 50°, and m∠SCU = 120°. Find the following:



a. m $\overset{\frown}{PWR}$ _____

b. m $\overset{\frown}{SQ}$ _____

11. $\overline{AB}$ is the diameter of the circle. Find:

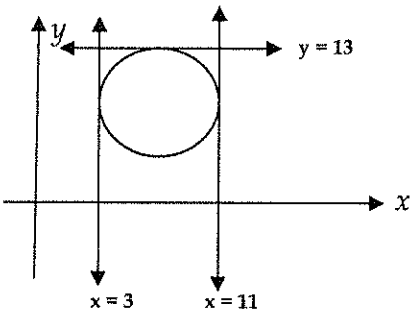


Slope of tangent line *m*_____ Center _____

Length of Radius _____

Equation of Circle:_____

12. Write the equation of the circle.

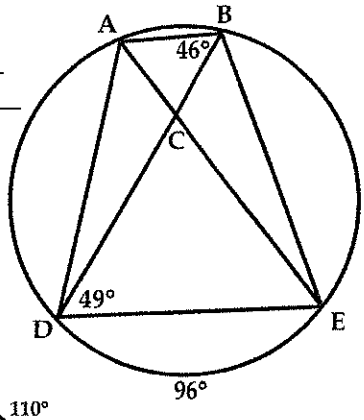


13. Find m$\overset{\frown}{AB}$_____

Find m$\overset{\frown}{ADE}$_____

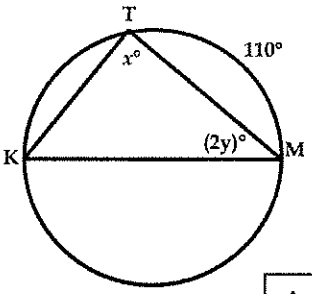
Find m∠ADE_____

Find m∠ACD_____



14. $\overline{KM}$ is the diameter of the circle.

Find *x*_____ *y* _____ m∠TKM_____



15. Find the area of a circle whose circumference is 64π cm. _____

16. Find the circumference of a circle whose area is 64π cm². _____

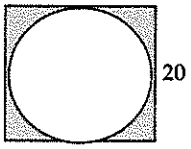
Answers

10. 310°, 50°
11. slope = $\frac{3}{2}$, (-5,2), r = $\sqrt{13}$, $(x+5)^2+(y-2)^2=13$
12. $(x-7)^2+(y-9)^2=16$
13. 74°, 188°, 86°, 95°
14. x=90, y=17.5, 55°
15. 1024π cm²
16. 16π cm

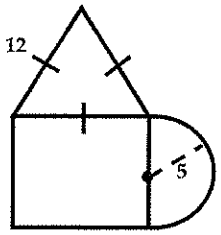
Chapter 9 Exam Review – Area

Sum Interior Angles=	Area Triangle =
Sum Exterior Angles=	Area Parallelogram =
Area Trapezoid =	Area Equilateral Triangle=
Area Rhombus=	Area Circle =
Area Reg Polygon =	Pop Density =

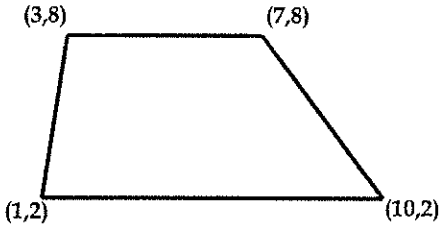
1. What is the EXACT shaded area?



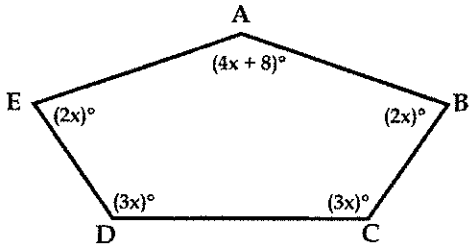
2. Find the EXACT total area.



3. Find the area of the trapezoid.

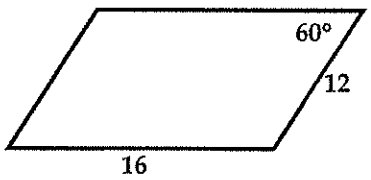


4. Find the measure of ∠A.



5. A rhombus has a perimeter of 60 feet and a diagonal 18 feet long. Find the area of the rhombus.

6. Find the EXACT area of the parallelogram.



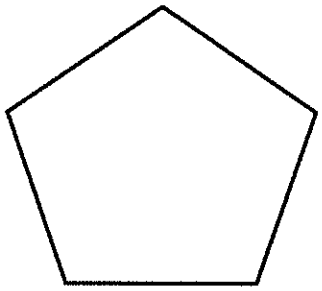
7. The interior angle of a regular polygon is 144°. Find the number of sides.

Answers
1. $400-100\pi$ u²
2. $36\sqrt{3} + 12.5\pi + 120$ u²
3. 39 u²
4. 160°
5. 216 sq feet
6. $96\sqrt{3}$ sq units
7. 10 sides

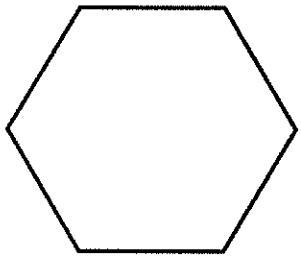
8. A triangle has an area of 78 square inches. If the base is 6 inches, what is the height?

Answers
8. 26 in
9. 208.2 m^2
10. $96\sqrt{3}$ in^2
11. $3240
12. 50%
13. 36%
14. $\frac{8}{9}$ or 89%

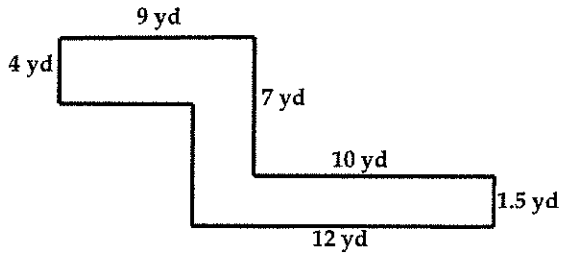
9. Find the area of a regular pentagon with a perimeter of 55 meters.



10. Find the area of a regular hexagon with a radius of 8 inches.

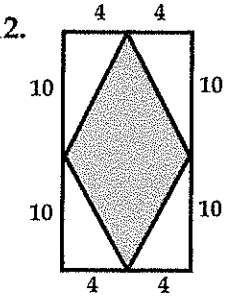


11. Joe is installing flooring in the space below. If the flooring costs $6.00 per square foot to install, approximately how much will it cost?

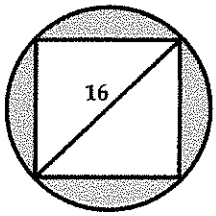


Find the probability of a randomly thrown dart hitting the shaded region.

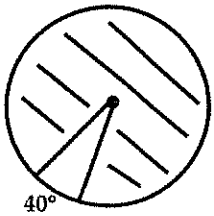
12.



13.



14.



Chapter 10 Exam Review – Surface Area and Volume

Surface Area:_____
Volume:_____

If the dimensions of a solid are multiplied by a, then the surface area is multiplied by_____ and the volume is multiplied by _____.

Converting square units	Converting cubic units
_____ square inches = 1 square foot	_____cubic inches= 1 cubic foot
_____ square feet = 1 square yard	_____cubic feet = 1 cubic yard

1. The surface area of a solid is 600 square millimeters. If the dimensions are multiplied by 3/5, what is the new surface area?_____

2. The volume of a solid is 60 cubic inches. If the dimensions are multiplied by 4, what is the new volume?_____

3. A cube has volume of 512 cubic feet. What is the surface area of the cube?

4. A cube has a surface area of 294 square inches. What is the volume of the cube?

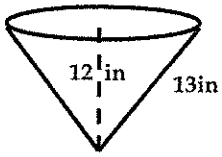
Answers
1. 216 mm^2
2. 3840 in^3
3. 384 ft^2
4. 343 in^3
5. 3.7 ft^2
6. 1620 ft^3
7. 18,756 gallons

5. A prism has a surface area of 530 square inches. What is the surface area in square feet?

6. A pyramid has a volume of 60 cubic yards. What is the volume in cubic feet?

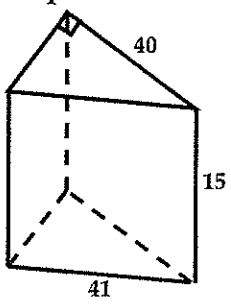
7. An oil tank is a cylinder with a diameter of 20 feet. If the tank is filled with oil to a depth of 8 feet, what is the volume of the oil (in gallons)? The volume of a cylinder is $\pi r^2 h$ and 1 gallon=0.134 ft^3.

8. Find the volume of a cone (in fluid ounces). The volume of a cone is $1/3\ \pi r^2 h$ and 1 fluid ounce = 1.805 in^3.

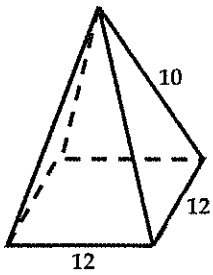


9. A rectangular prism has a surface area of 190 square feet . The base of the prism is a square with an area of 25 square feet. What is the height of the prism?

10. Find the surface area of the triangular prism.



11. Find the surface area of the square pyramid.



12. Find the volume of a sphere if the surface area of the sphere is 484π square inches. The surface area of a sphere is $4\pi r^2$ and the volume is $4/3\ \pi r^3$.

13. Find surface area and volume of a rectangular prism that is 7 feet wide by 8 feet deep by 5 feet tall.

14. Find the surface area and volume of a hemisphere with a radius of 4 inches.

Answers
8. 174 fluid ounces
9. 7 feet
10. 1710 u^2
11. 336 u^2
12. $1774\frac{2}{3}\pi\ in^3$
13. SA=262 ft^2, V=280 ft^3
14. SA=48π in^2, $V=42\frac{2}{3}\pi\ in^3$