Name: _____ Date: _____ Period: _____

Geometry Final Exam Review

1. Fill in the flow chart below with the properties that belong to each polygon.

Parallelogram:

1. opposite sides are parallel
2. opposite angles are congruent
3. opposite sides are congruent
4. consecutive angles are supplementary
5. diagonals bisect each other

Rectangle:

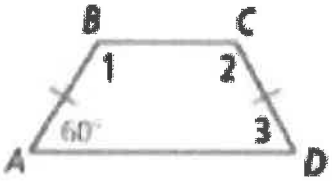
1. diagonals are congruent
2. All angles are 90°

Rhombus:

1. diagonals are perpendicular
2. diagonals bisect angles
3. all sides are congruent

Square

2. Find the measure of each numbered angle:

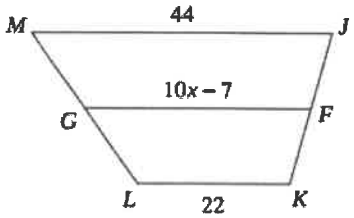


$m\angle 1 = 120°$

$m\angle 2 = 120°$

$m\angle 3 = 60°$

3. Find the value of x



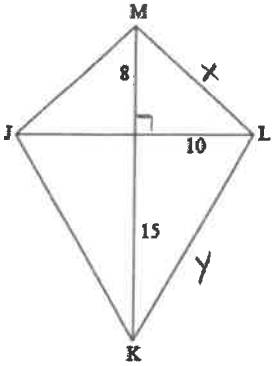
$10x - 7 = \frac{1}{2}(44 + 22)$

$10x - 7 = 33$

$10x = 40$

$x = 4$

4. Calculate the perimeter of the kite below:



$8^2 + 10^2 = x^2$

$64 + 100 = x^2$

$\sqrt{164} = x$

$10^2 + 15^2 = y^2$

$\sqrt{325} = y$

$P = \sqrt{164} + \sqrt{164} + \sqrt{325} + \sqrt{325}$

≈ 61.7

Name: _____ Date: _____ Period: _____

Geometry Final Exam Review

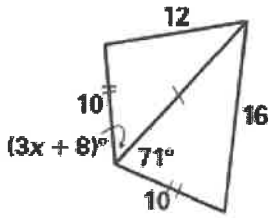
1. A triangle has one side of length 10 and another of length 6. Describe the possible lengths of the third side.

$10 + 6 > x$ $\quad 10 + x > 6$ $\quad 6 + x > 10$

$16 > x$ $\quad x > -4$ $\quad x > 4$

$4 < x < 16$

2. Use the Hinge Theorem or its converse and properties of triangles to write and solve an inequality to describe a restriction on the value of *x*.

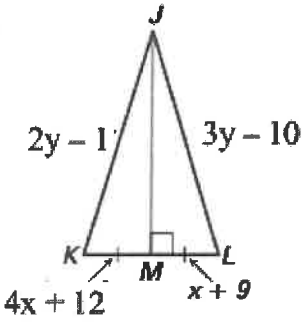


$71 > 3x + 8$

$63 > 3x$

$21 > x$

3. Find the value of *x* and *y*. Then find the following lengths: JK, KM, KL, JM



$4x + 12 = x + 9$

$3x = -3$

$x = -1$

$2y - 1 = 3y - 10$

$9 = y$

$JK = 2(9) - 1$

$= 17$

$KL = 4(-1) + 12 + (-1) + 9$

$= 16$

$KM = 4(-1) + 12$

$= 8$

$(JM)^2 + 8^2 = 17^2$

$JM = 15$

x: -1

y: 9

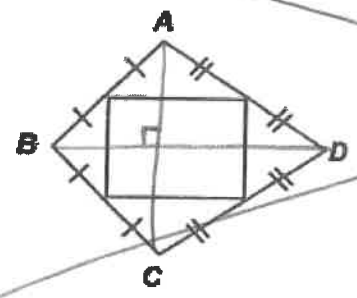
JK: 17

KM: 8

KL: 16

JM: 15

4. Find the area and perimeter of the ~~rectangle~~ kite if AC = 10 and BD = 24



$A = \frac{10(24)}{2}$

$= 120$

Area: $120\ u^2$

Perimeter:

5. Solve the proportion for x.

a). $\frac{30}{5} = \frac{14}{x}$

$30x = 70$

$x = 7/3$

x = 7/3

b). $\frac{4}{x-3} = \frac{8}{x}$

$4x = 8(x-3)$

$4x = 8x - 24$

$-4x = -24$

$x = 6$

x = 6

c). $\frac{3x-8}{6} = 2\frac{x}{10}$ $\quad \frac{3x-8}{6} = \frac{2x}{10}$

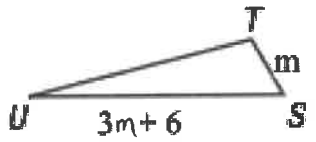
$30x - 80 = 12x$

$-80 = -18x$

$\frac{40}{9} = x$

x = 40/9

6. The ratio of SU: ST is 4:1, solve for m



$\frac{SU}{ST} = \frac{4}{1}$

$\frac{3m+6}{m} = \frac{4}{1}$

$4m = 3m + 6$

$m = 6$

m = 6

7. Find the geometric mean of the two numbers, write answers as simplified radicals.

a). 4 and 25

$\sqrt{4 \cdot 25}$

$\sqrt{100}$

10

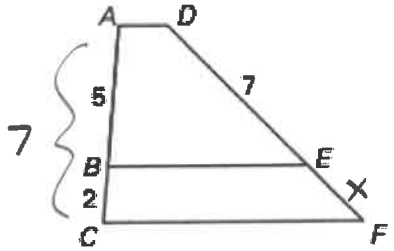
b). 3 and 16

$\sqrt{3 \cdot 16}$

$4\sqrt{3}$

8. Use the diagram to find the unknown length.

a). $\frac{AB}{AC} = \frac{DE}{DF}$. Find EF



$\frac{5}{7} = \frac{7}{7+x}$

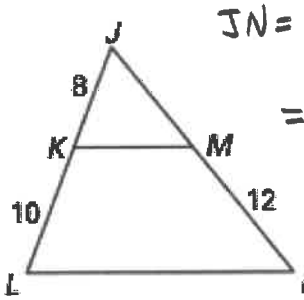
$49 = 35 + 5x$

$14 = 5x$

$\frac{14}{5} = x$

EF = 14/5

b). $\frac{JK}{KL} = \frac{JM}{MN}$. Find JN



$JN = \frac{96}{10} + 12$

$= \frac{108}{5}$

$= 21.6$

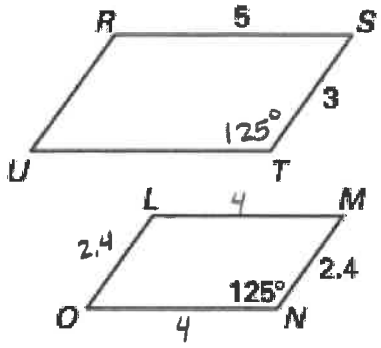
$\frac{8}{10} = \frac{JM}{12}$

$\frac{96}{10} = JM$

JN = 108/5 or 21.6

$\frac{3}{2.4} = \frac{5}{4}$

9. Use the diagram below. ▱RSTU ~ ▱LMNO.



a). Find the scale factor of ▱RSTU ~ ▱LMNO. 5/4

b). Find the length of $\overline{NO}$. 4

c). Find the measure of ∠U. 55°

* in a parallelogram consecutive angles are supplementary

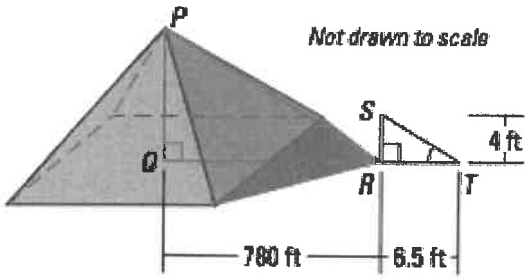
d). Find the perimeter of ▱LMNO. 12.8

$\frac{NO}{5} = \frac{2.4}{3}$

e). Find the perimeter of ▱ RSTU to the perimeter of ▱LMNO . 5/4

* same as scale factor of sides

10. The Greek mathematician Thales (640-546 B.C.) calculated the height of the Great Pyramid in Egypt by placing a rod at the tip of the pyramid's shadow and using similar triangles. Find the height of the Great Pyramid.



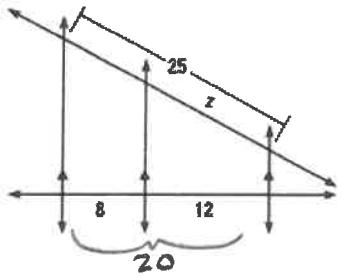
$\frac{4}{x} = \frac{6.5}{780}$

$6.5x = 3120$

$x = 480$ ft

11. Find the value of the variable.

a).

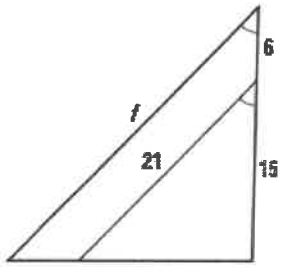


$\frac{25}{20} = \frac{z}{12}$

$20z = 300$

$z = 15$

b).

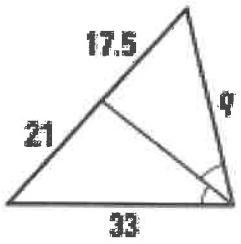


$\frac{21}{f} = \frac{15}{21}$

$15f = 441$

$f = 29.4$

c).



$\frac{17.5}{21} = \frac{q}{33}$

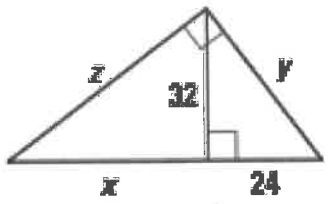
$21q = 577.5$

$q = 27.5$

z = 15 t = 29.4 q = 27.5

12. Find the value of each variable.

a).



$\frac{32}{x} = \frac{24}{32}$

$1024 = 24x$

$\frac{128}{3} = x$

$\frac{y}{24} = \frac{x+24}{y}$

$\frac{y}{24} = \frac{200/3}{y}$

$y^2 = 1600$

$y = 40$

$\frac{z}{x} = \frac{x+24}{z}$

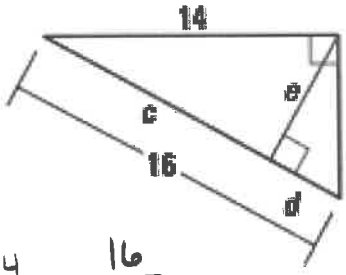
$\frac{z}{128/3} = \frac{200/3}{z}$

$z^2 = \left(\frac{200}{3}\right)\left(\frac{128}{3}\right)$

$z = 160/3$

x = $128/3$ y = 40 z = $160/3$

b).



$\frac{14}{c} = \frac{16}{14}$

$196 = 16c$

$49/4 = c$

$\frac{e}{49/4} = \frac{15/4}{e}$

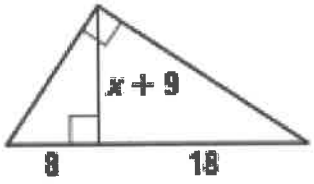
$e^2 = \frac{735}{16}$

$e = \frac{\sqrt{735}}{4}$

c = $49/4$ d = $15/4$ e = $\frac{\sqrt{735}}{4} \approx 6.7$

13. Find the value of x. Simplify answers that are radicals.

a).



$\frac{8}{x+9} = \frac{x+9}{18}$

$144 = (x+9)(x+9)$

$144 = x^2 + 18x + 81$

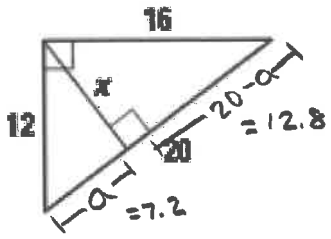
$0 = x^2 + 18x - 63$

$0 = (x-3)(x+21)$

$x = 3, -21$

x = 3

b).



$\frac{12}{a} = \frac{20}{12}$

$144 = 20a$

$7.2 = a$

$\frac{x}{7.2} = \frac{12.8}{x}$

$x^2 = 92.16$

$x = 9.6$

x = 9.6

14. Decide whether the numbers can represent the side lengths of a triangle. If they can, classify the triangle as acute, right, or obtuse.

a). 5, 12, 13

$5+12>13$ ✓

Can be a △

$5^2+12^2 \stackrel{?}{=} 13^2$

$25+144 \stackrel{?}{=} 169$

$169 \stackrel{?}{=} 169$

Triangle: yes

Classify: Right

b). 20, 21, 28

$20+21>28$ ✓

$20^2+21^2 \stackrel{?}{>} 28^2$

$400+441 \stackrel{?}{>} 784$

$841 \stackrel{?}{>} 784$

$>$

Triangle: yes

Classify: Acute

c). $\sqrt{8}$, 4, 6

$\sqrt{8}+4>6$ ✓

$(\sqrt{8})^2+4^2 \stackrel{?}{<} 6^2$

$8+16 \stackrel{?}{<} 36$

$24 \stackrel{?}{<} 36$

$<$

Triangle: yes

Classify: Obtuse

d). 10, $\sqrt{13}$, 12

$10+\sqrt{13}>12$ ✓

$10^2+\sqrt{13}^2 \stackrel{?}{<} 12^2$

$113 \stackrel{?}{<} 144$

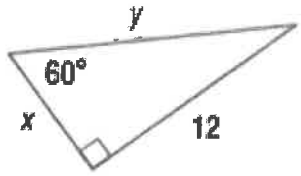
$<$

Triangle: yes

Classify: Obtuse

15. Find the value of each variable. Write answers in simplest radical form.

a).

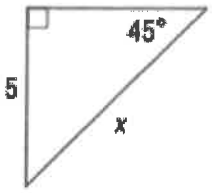


$x = \frac{12}{\sqrt{3}}$

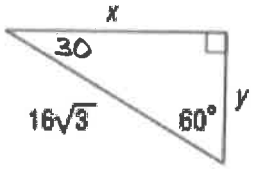
$= 4\sqrt{3}$

$y = 8\sqrt{3}$

b).



c).



$16\sqrt{3} = 2y$

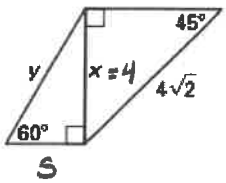
$8\sqrt{3} = y$

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

$= 8(3)$

$= 24$

d).



$4 = \sqrt{3}s$

$\frac{4}{\sqrt{3}} = s$

$y = 2(4/\sqrt{3})$

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

x = $4\sqrt{3}$ y = $8\sqrt{3}$ x = $5\sqrt{2}$

x= 24 y = $8\sqrt{3}$ x = 4 y = $\frac{8}{3}\sqrt{3}$

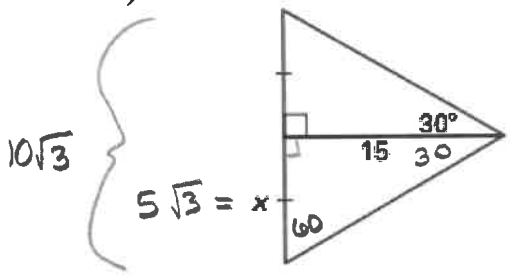
30-60-90

long = $\sqrt{3}$ short

hyp = 2 short

16. Find the area of the triangle. Round decimals to the nearest tenth.

a).



long = $\sqrt{3}$ short

$15 = \sqrt{3}\, x$

$\frac{15}{\sqrt{3}} = x$

$5\sqrt{3} = x$

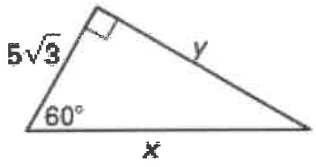
$A = \frac{1}{2}bh$

$= \frac{1}{2}(10\sqrt{3})(15)$

$= 75\sqrt{3}$

A = $75\sqrt{3} \approx 129.9$

b).



long = $\sqrt{3}$ short

$y = \sqrt{3}(5\sqrt{3})$

$y = 15$

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

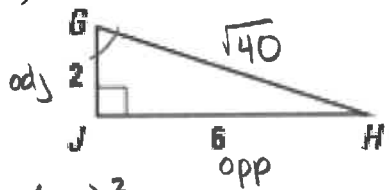
$= \frac{1}{2}(5\sqrt{3})(15)$

$= \frac{75}{2}\sqrt{3}$

A = 135.2

17. Solve the right triangle. Round decimals to the nearest tenth.

a).



$2^2 + 6^2 = (GH)^2$

$4 + 36 = (GH)^2$

$\sqrt{40}$

$\tan G = \frac{6}{2}$

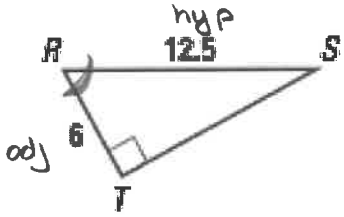
$G = \tan^{-1}(3)$

GH = $\sqrt{40} = 6.3$

∠G = 71.6°

∠H = 18.4°

b).



$6^2 + (TS)^2 = 12.5^2$

TS = 10.9

$\cos R = \frac{6}{12.5}$

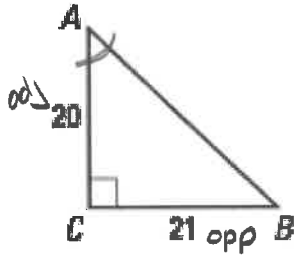
$R = \cos^{-1}(6/12.5)$

ST = 11

∠R = 61.3°

∠S = 28.7°

c).



$20^2 + 21^2 = (AB)^2$

$29 = AB$

$\tan A = 21/20$

$A = \tan^{-1}(21/20)$

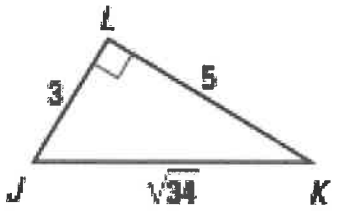
AB = 29

∠A = 46.4°

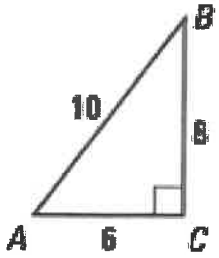
∠B = 43.6°

18. Find the sine, cosine, and the tangent of the acute angles of the triangle. Express each value as a decimal rounded to four places.

a).



b).

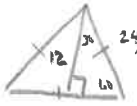


sin J = $5/\sqrt{34} = 0.857$ sin K = $3/\sqrt{34} = 0.5145$ sin A = $8/10 = 0.8$ sin B = $6/10 = 0.6$

cos J = $3/\sqrt{34} = 0.5145$ cos K = $5/\sqrt{34} = 0.8575$ cos A = $6/10 = 0.6$ cos B = $8/10 = 0.8$

tan J = $5/3 = 1.6667$ tan K = $3/5 = 0.6$ tan A = $8/6 = 1.3333$ tan B = $6/8 = 0.75$

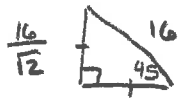
19. The altitude of an equilateral triangle is 12 centimeters Find the ~~perimeter~~ area of the triangle.



hyp = 2 short $12 = \sqrt{3}$ short hyp = $24/\sqrt{3}$

long = $\sqrt{3}$ short $12/\sqrt{3}$ = short $A = \frac{1}{2}(24/\sqrt{3})(24/\sqrt{3}) = 96$

20. The hypotenuse of an isosceles right triangle is 16 centimeters. Find the area of the triangle.

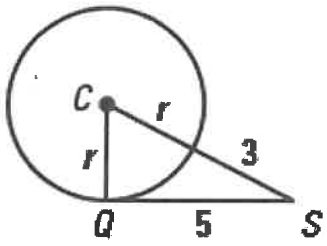


hyp = $\sqrt{2}$ leg $16/\sqrt{2}$ = leg $A = \frac{1}{2}(16/\sqrt{2})(16/\sqrt{2})$

$16 = \sqrt{2}$ leg $= 64$

21. Find the value(s) of the variable given that P, Q, and R are points of tangency.

a).



$r^2 + 5^2 = (r+3)^2$

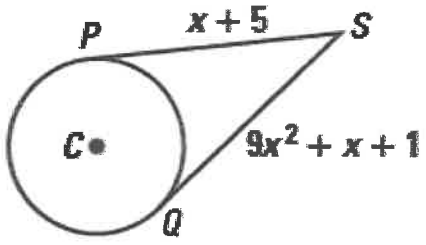
$r^2 + 25 = r^2 + 6r + 9$

$16 = 6r$

$16/6 = r$

$2.\overline{6} = r$

b).



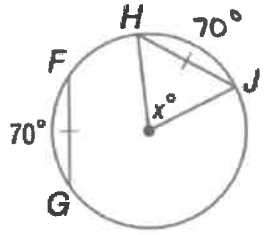
$x + 5 = 9x^2 + x + 1$

$4 = 9x^2$

$4/9 = x^2$

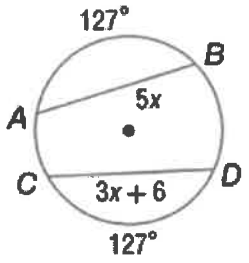
$\pm 2/3 = x$

c).



$x = 70°$

d).



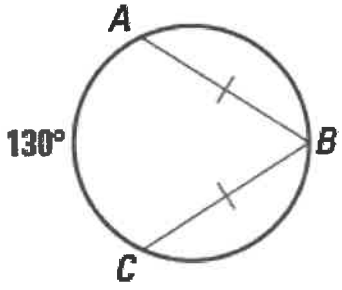
$5x = 3x + 6$

$2x = 6$

$x = 3$

22. Find the measure of $\overset{\frown}{AB}$.

a).

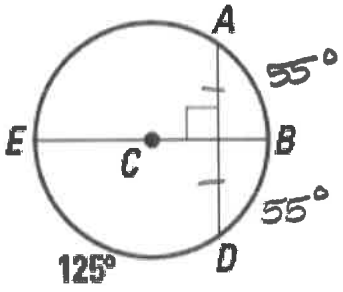


$360 - 130 = 230$

$\frac{230}{2} = 115°$

$m\overset{\frown}{AB} = 115°$

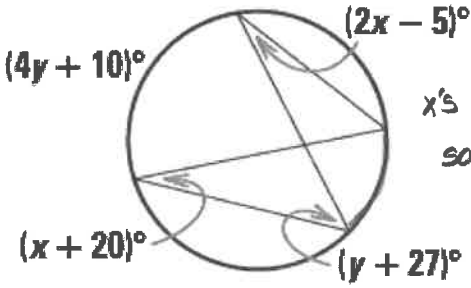
b).



$m\overset{\frown}{AB} = 55°$

23. Find the values of the variables.

a).



x's intercepting same arc!

$2x - 5 = x + 20$

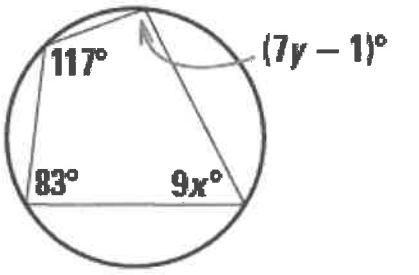
$x = 25$

$\frac{1}{2}(4y + 10) = y + 27$

$2y + 5 = y + 27$

$y = 22$

b).



$117 + 9x = 180$

$9x = 63$

$x = 7$

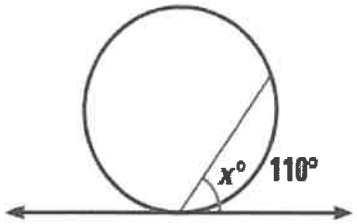
$83 + 7y - 1 = 180$

$7y = 98$

$y = 14$

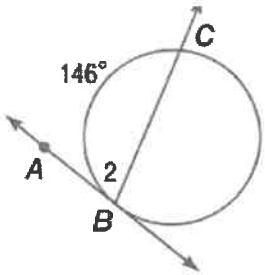
24. Find the value of x unless otherwise stated.

a).



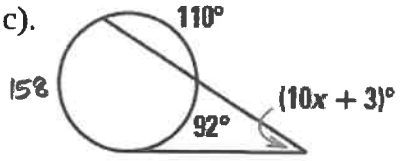
$X = 55°$

b). Find the $m\angle 2$



$m\angle 2 = 73°$

c).



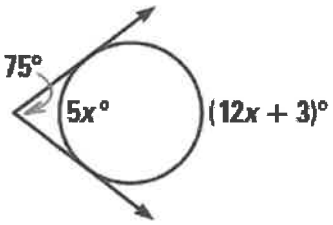
$10x+3 = \frac{1}{2}(158 - 92)$

$10x+3 = 33$

$10x = 36$

$x = 3.6$

d).



$75 = \frac{1}{2}(12x+3-5x)$

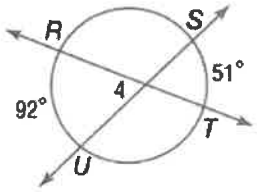
$75 = \frac{1}{2}(7x+3)$

$150 = 7x+3$

$147 = 7x$

$21 = x$

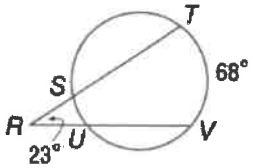
e). Find the $m\angle 4$



$m\angle 4 = \frac{1}{2}(92+51)$

$m\angle 4 = 71.5°$

f). Find the $m\overset{\frown}{SU}$



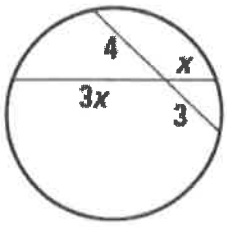
$23 = \frac{1}{2}(68 - m\overset{\frown}{SU})$

$46 = 68 - m\overset{\frown}{SU}$

$22° = m\overset{\frown}{SU}$

25. Find the value of x.

a).



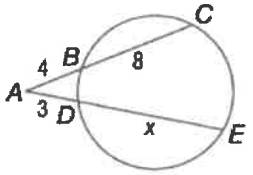
$4(3) = 3x(x)$

$12 = 3x^2$

$4 = x^2$

$2 = x$

b).



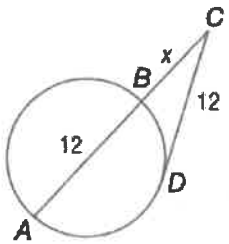
$4(12) = 3(3+x)$

$48 = 9+3x$

$39 = 3x$

$13 = x$

c).



$x(12+x) = 12^2$

$12x + x^2 = 144$

$x = 7.4, -19.4$

$x^2+12x-144 = 0$

$x = \frac{-12 \pm \sqrt{12^2 - 4(1)(-144)}}{2(1)}$

$x = 7.4$

26. What is the center and radius of a circle with equation $(x+7)^2 + (y-11)^2 = 144$

center: $(-7, 11)$

$r = 12$

Chapter 11: Area of Polygons and Circles

a) Circumference Formula:

$C = 2\pi r$

b) Area Formula:

$A = \pi r^2$

c) Arc Length Formula:

$$\frac{l}{2\pi r} = \frac{\text{arc measure}}{360^\circ}$$

d) Area of a Sector Formula:

$$\frac{A}{\pi r^2} = \frac{\text{arc measure}}{360^\circ}$$

~~e) Area of a Segment Formula:~~

27. Find the sum of the measures of the interior angles of the indicated convex polygon.

a) Dodecagon

$(12-2)180$

1800°

b) 24-gon

$(24-2)180$

3960°

28. Find the value of n for each regular n-gon described.

a) Each interior angle of the regular n-gon has a measure of 162°.

$$162 = \frac{(n-2)180}{n}$$

$162n = 180n - 360$

$-18n = -360$

$n = 20$

20 sides

b) Each exterior angle of the regular n-gon has a measure of 5°.

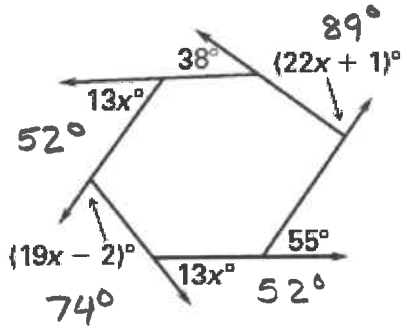
$$5 = \frac{360}{n}$$

$5n = 360$

$n = 72$

72 sides

29. Find the value of x, and the measure of the missing angles.



$360 = 13x + 38 + 22x + 1 + 55 + 13x + 19x - 2$

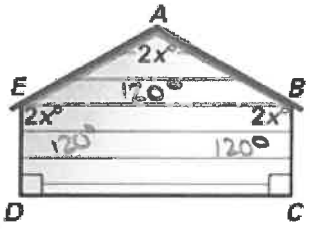
$360 = 67x + 92$

$268 = 67x$

$4 = x$

30. The side view of a storage shed is shown below. Find the value of x. Then determine the measure of each angle.

$(5-2)180 = 540$



$540 = 2x+2x+2x+90+90$

$540 = 6x + 180$

$360 = 6x$

$60 = x$

31. Find the circumference of the circle with an area of 64π mi^2

$A = \pi r^2$

$64\pi = \pi r^2$

$64 = r^2$

$8 = r$

$C = 2\pi r$

$C = 2\pi(8)$

$C = 16\pi$ mi

32. Find the area of a circle with circumference of 6π yards.

$C = 2\pi r$

$6\pi = 2\pi r$

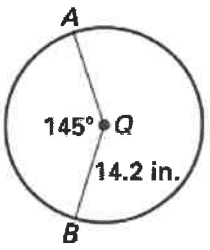
$3 = r$

$A = \pi(3)^2$

$= 9\pi$ yd^2

33. Find the length of $\overset{\frown}{AB}$.

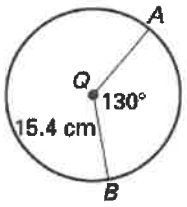
a)



$\frac{\ell \overset{\frown}{AB}}{2\pi(14.2)} = \frac{145}{360}$

$\ell \overset{\frown}{AB} = 35.9$ in

b)

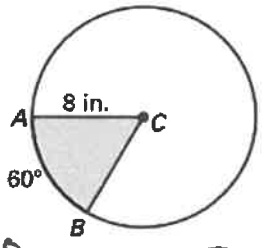


$\frac{\ell \overset{\frown}{AB}}{2\pi(15.4)} = \frac{130}{360}$

$\ell \overset{\frown}{AB} = 34.9$ cm

34. Find the area and perimeter of the shaded regions.

a)



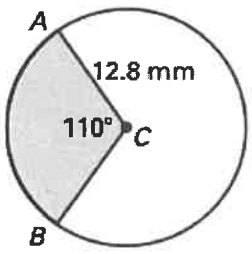
$\frac{A}{\pi(8)^2} = \frac{60}{360}$

$A = 33.5$ in^2

$\frac{\ell \overset{\frown}{AB}}{2\pi\ 8} = \frac{60}{360}$

$\ell \overset{\frown}{AB} = 8.4$ in

b)



$\frac{A}{\pi(12.8)^2} = \frac{110}{360}$

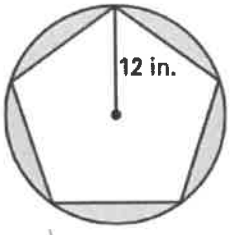
$A = 157.3$ mm^2

$\frac{\ell \overset{\frown}{AB}}{2\pi(12.8)} = \frac{110}{360}$

$\ell \overset{\frown}{AB} = 24.6$ mm

35. Find the area of the shaded regions.

a).



$A_{shaded} = A_c - A_p$

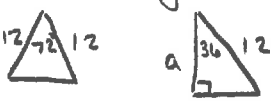
$= \pi(12)^2 - \frac{1}{2}aP$

$= \pi(12)^2 - \frac{1}{2}(12\cos 36)(5)(24\sin 36)$

$= 110 \text{ in}^2$

Polygon

central angle $= 72°$



$\cos 36 = \frac{a}{12}$

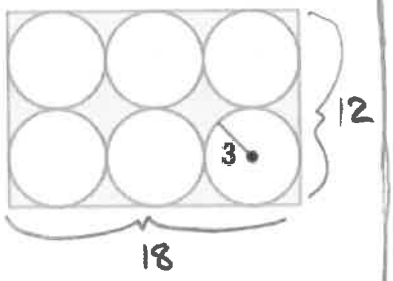
$12\cos 36 = a$

$\sin 36 = \frac{o}{12}$

$12\sin 36 = o$

$24\sin 36 = \text{side}$

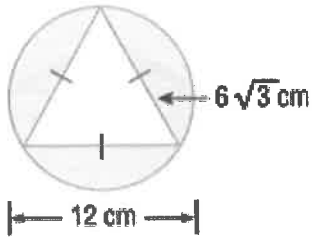
b).



$A_{shaded} = (12)(18) - 6[\pi(3)^2]$

$A = 46.4 \text{ u}^2$

c).

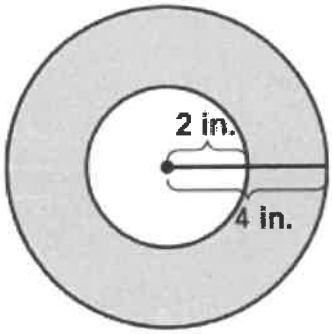


$A_{sh} = A_{circle} - A_{\triangle}$

$= \pi(6)^2 - \left(\frac{\sqrt{3}}{4}(6\sqrt{3})^2\right)$

$= 66.3 \text{ cm}^2$

36. Find the area of the large circle and area of the shaded region, be sure to include your units. What is the probability of landing in the shaded region, if you are equally as likely to land on any point within the circles?



$A_w = \pi(2)^2 = 4\pi$

$A_s = A_l - A_w$

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

$= 16\pi - 4\pi$

$= 12\pi$

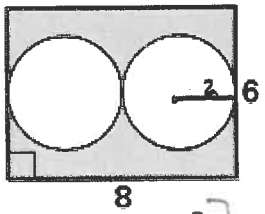
$P = \frac{A_s}{A_{whole}}$

$= \frac{12\pi}{16\pi}$

$= \frac{3}{4}$ or 75%

37. Find the probability that a randomly chosen point in the figure lies in the shaded region.

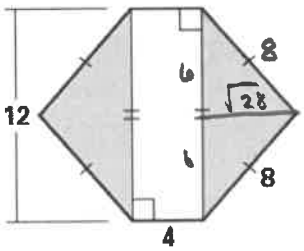
a)



$P = \frac{6(8) - 2[\pi(2)^2]}{6(8)}$

$= 0.48$ 48%

b)



$6^2 + h^2 = 8^2$

$h^2 = 28$

$h = \sqrt{28}$

$P = \frac{2[\frac{1}{2}(12)(\sqrt{28})]}{2(\frac{1}{2}(12)(\sqrt{28})) + 4(12)}$

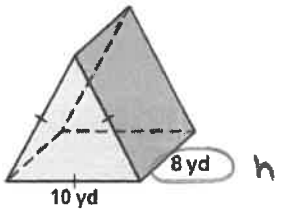
$= 0.57$ 57%

38. Define a polyhedron.

a solid figure w/ polygon faces.

39. Find the volume, lateral area, and surface area of each solid.

a)



$V = Bh$

$= \frac{\sqrt{3}}{4}(10)^2(8)$

$= 346.4\ yd^3$

$LA = Ph$

$= 30(8)$

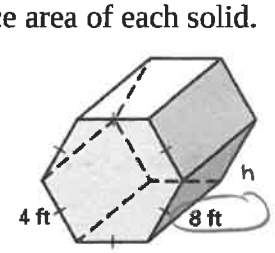
$= 240\ yd^2$

$SA = LA + 2B$

$= 240 + 2\left(\frac{\sqrt{3}}{4}(10)^2\right)$

$= 326.6\ yd^2$

b)



$\tan 30 = \frac{2}{a}$

$a = \frac{2}{\tan 30}$

$V = Bh$

$= \frac{1}{2}aPh$

$= \frac{1}{2}\left(\frac{2}{\tan 30}\right)(6)(4)(8)$

$= 332.6\ ft^3$

$LA = Ph$

$= 24(8)$

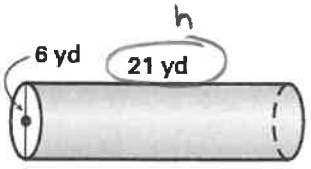
$= 192\ ft^2$

$SA = LA + 2B$

$= 192 + 2(1/2)(2/\tan 30)(6)(4)$

$= 275.1\ ft^2$

c).



$V = Bh$

$= \pi(3)^2(21)$

$= 189\pi\ yd^3$

$LA = 2\pi rh$

$= 2\pi(3)(21)$

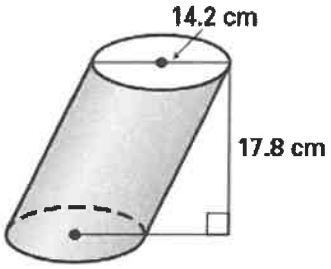
$= 126\pi\ yd^2$

$SA = LA + 2B$

$= 126\pi + 2(\pi(3)^2)$

$= 144\pi\ yd^2$

40. Use Cavalieri's Principle to find the volume of the oblique prism or cylinder.



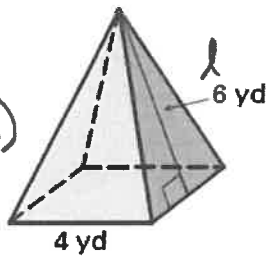
$V = Bh$

$= \pi(7.1)^2(17.8)$

$= 897.3\pi\ cm^3$

41. Find the volume, lateral area, and surface area of each solid.

a)



$h^2 + 2^2 = 6^2$

$h = \sqrt{32}$

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

$= \frac{1}{3}(4)^2(\sqrt{32})$

$= 30.2\ yd^3$

$L = \frac{1}{2}Pl$

$= \frac{1}{2}(16)(6)$

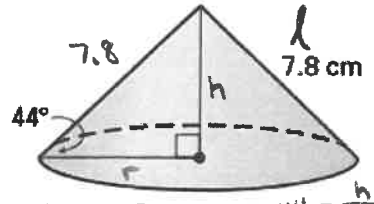
$= 48\ yd^2$

$SA = \frac{1}{2}Pl + B$

$= 48 + (4)(4)$

$= 64\ yd^2$

b)



$\cos 44 = \frac{r}{7.8}$

$7.8\cos 44 = r$

$\sin 44 = \frac{h}{7.8}$

$7.8\sin 44 = h$

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

$= \frac{1}{3}\pi(7.8\cos 44)^2(7.8\sin 44)$

$= 178.6\ cm^3$

$LA = \pi rl$

$= \pi(7.8\cos 44)(7.8)$

$= 137.5\ cm^2$

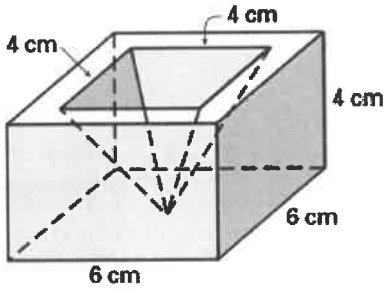
$SA = \pi rl + \pi r^2$

$= 137.5 + \pi(7.8\cos 44)^2$

$= 236.4\ cm^2$

42. Find the volume of the solid. The prisms, pyramids, and cones are right.

a).



b).

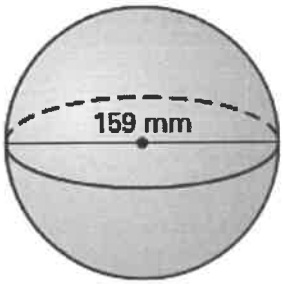
$V = \text{prism} - \text{pyramid}$

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

$= 6(6)(4) - \frac{1}{3}(4)(4)(4)$

$= 122.67\ cm^3$

43. Find the volume and surface area of the sphere.



$V = \frac{4}{3}\pi r^3$

$= \frac{4}{3}\pi(79.5)^3$

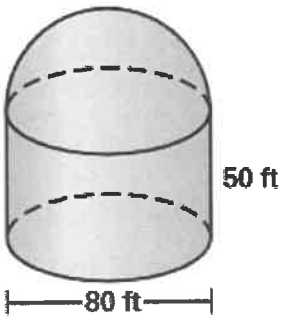
$= 669946.5\pi\ mm^3$

$SA = 4\pi r^2$

$= 4\pi(79.5)^2$

$= 25281\pi\ mm^2$

44. **Storage Tank** A grain storage tank is in the shape of a cylinder covered by a half sphere as shown. The height of the cylinder is 50 feet and its diameter is 80 feet. Find the total ~~surface area~~ (including the base) and volume of the tank. volume



$V = \text{cylinder} + \frac{1}{2}\text{ sphere}$

$= \pi(40)^2(50) + \frac{1}{2}\left(\frac{4}{3}\pi(40)^3\right)$

$= 80{,}000\pi + 42{,}666.67\pi$

$= 122{,}666.67\pi\ ft^3$

45. Two similar prisms have a scale factor of 4 : 17. The larger prism has a volume of 147,390 cubic yards. Find the volume of the smaller prism.

$\left(\frac{4}{17}\right)^3 = \frac{V}{143{,}390}$

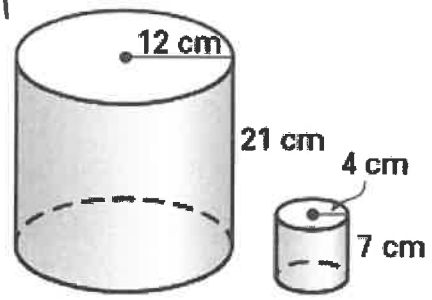
$917{,}6960 = 4913V$

$1867.9\ yd^3 = V$

46.

What is the ratio of the height of the larger cylinder to the height of the smaller cylinder? $\frac{21}{7} = 3:1$

What is the ratio of the radius of the larger cylinder to the radius of the smaller cylinder? $\frac{12}{4} = 3:1$



$\frac{24\pi}{8\pi} = 3:1$ Find the ratio of the circumference of the bases.

$9:1$ Find the ratio of the surface areas of the cylinders.

Find the ratio of the volumes of the cylinders.

$27:1$

$2\pi r$

$C_l = 2\pi(12) = 24\pi$

$C_s = 2\pi(4) = 8\pi$