Name: _____ Date: _____ Period: _____

Geometry CC 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:

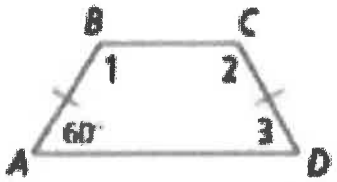
1. diagonals are congruent
2. all angles are 90°

Rhombus:

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

Square

2. Find the measure of each numbered angle:

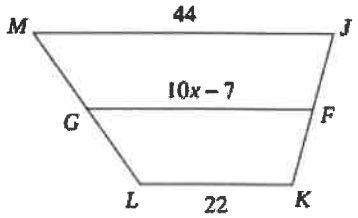


$m\angle 1 = 120°$

$m\angle 2 = 120°$

$m\angle 3 = 60°$

3. Find the value of x



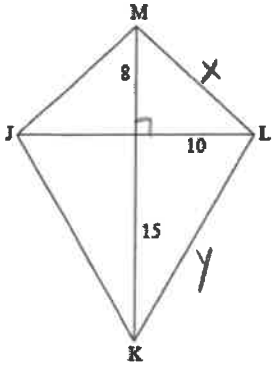
$10x - 7 = \frac{1}{2}(44 + 22)$

$10x - 7 = 33$

$10x = 40$

$x = 4$

4. Calculate the perimeter of the kite below:



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

$164 = x^2$

$\sqrt{164} = x$

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

$325 = y^2$

$\sqrt{325} = y$

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

≈ 61.7

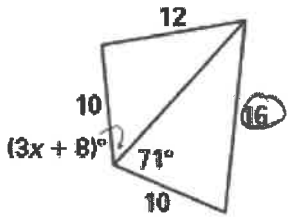
5. A triangle has one side of length 10 and another of length 6. Describe the possible lengths of the third side.

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

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

$4<x<16$

6. 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.

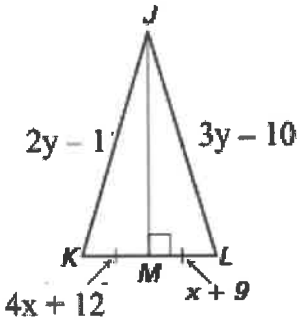


$71 > 3x+8$

$63 > 3x$

$21 > x$

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



$4x+12 = x+9$

$3x = -3$

$x = -1$

$2y-1 = 3y-10$

$9 = y$

$JK = 2(9)-1$

$= 17$

$KM = 4(-1)+12$

$= 8$

x: -1

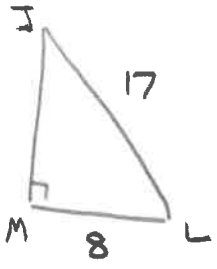
y: 9

JK: 17

KM: 8

KL: 16

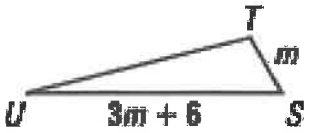
JM: 15



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

$JM = 15$

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



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

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

$3m+6 = 4m$

$6 = m$

m = 6

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

a). 4 and 25

$\sqrt{4 \cdot 25}$

$= \sqrt{100} = 10$

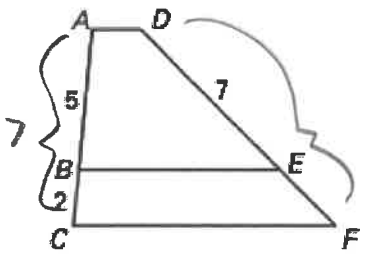
b). 3 and 16

$\sqrt{3 \cdot 16}$

$4\sqrt{3}$

10. Use the diagram to find the unknown length.

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



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

$49 = 5(7+EF)$

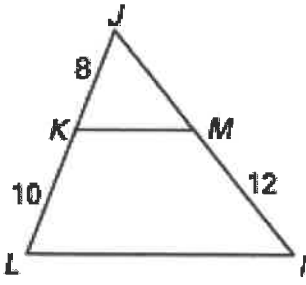
$49 = 35 + 5(EF)$

$14 = 5(EF)$

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

EF = 14/5

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



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

$96 = 10(JM)$

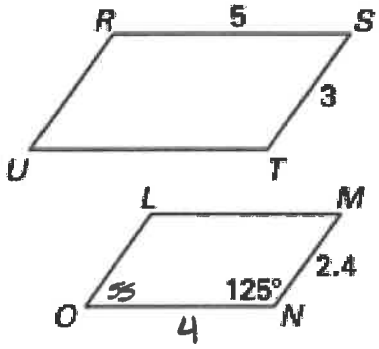
$96/10 = JM$

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

$= 21.6$

JN = 21.6

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



a). Find the scale factor of ▱RSTU ~ ▱LMNO. 3/2.4 = 5/4

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

c). Find the measure of ∠U. 55°

d). Find the perimeter of ▱LMNO. 12.8

$4+4+2.4+2.4$

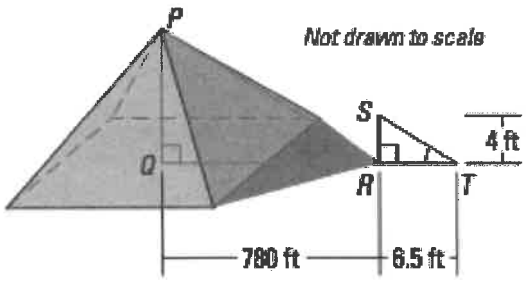
$\frac{3}{2.4} = \frac{5}{NO}$

$3(NO) = 12$

$NO = 4$

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

12. 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.



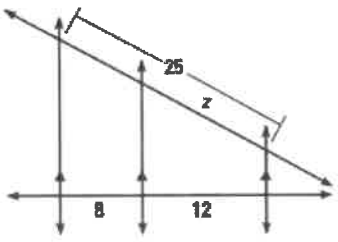
$\frac{4}{h} = \frac{6.5}{780}$

$6.5h = 3120$

$h = 480$ ft

13. Find the value of the variable.

a).

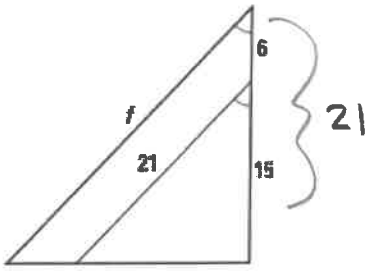


$\frac{25}{20} = \frac{z}{12}$

$20z = 300$

$z = 15$

b).

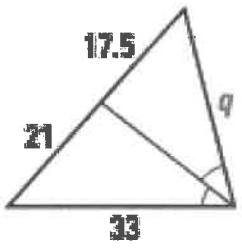


$\frac{f}{21} = \frac{21}{15}$

$15f = 441$

$f = 29.4$

c).



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

$21q = 577.5$

$q = 27.5$

z = 15 t = 29.4 q = 27.5

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

$5+12 > 13$ ✓

$5^2 + 12^2 \;?\; 13^2$

$25+144 \;?\; 169$

$169 \;?\; 169$

$=$

Triangle: yes

Classify: right

b). 20, 21, 28

$20+21 > 28$ ✓

$20^2 + 21^2 \;?\; 28^2$

$400+441 \;?\; 784$

$841 \;?\; 784$

$>$

Triangle: yes

Classify: acute

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

$\sqrt{8}+4 > 6$ ✓

$\sqrt{8}^2 + 4^2 \;?\; 6^2$

$8+16 \;?\; 36$

$24 \;?\; 36$

$<$

Triangle: yes

Classify: obtuse

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

$10+\sqrt{13} > 12$ ✓

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

$113 \;?\; 144$

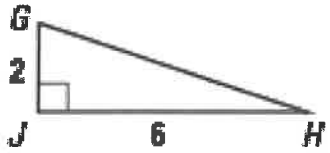
$<$

Triangle: yes

Classify: obtuse

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

a).



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

$4+36 = (GH)^2$

$\sqrt{40} = GH$

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

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

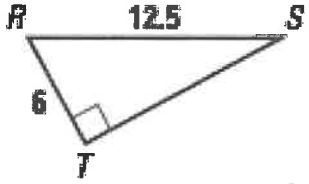
$= 71.6°$

GH = $\sqrt{40}$

∠G = 71.6°

∠H = 18.4°

b).



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

$36 + (ST)^2 = 156.25$

$(ST)^2 = 120.25$

$ST = 10.9$

ST = 10.9

∠R = 61.3°

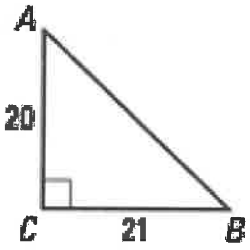
∠S = 28.7°

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

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

$= 61.3°$

c).



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

$\sqrt{841} = AB$

$29 = AB$

AB = 29

∠A = 46.4°

∠B = 43.6°

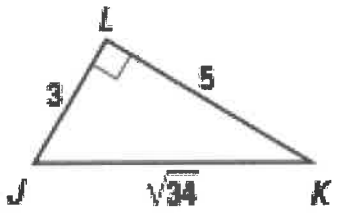
$\tan A = 21/20$

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

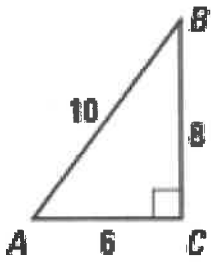
$A = 46.4°$

16. 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 = $5/\sqrt{34}$ sin K = $3/\sqrt{34}$ sin A = $8/10$ sin B = $6/10$

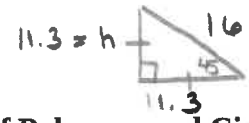
cos J = $3/\sqrt{34}$ cos K = $5/\sqrt{34}$ cos A = $6/10$ cos B = $8/10$

tan J = $5/3$ tan K = $3/5$ tan A = $8/6$ tan B = $6/8$

17. The altitude of an equilateral triangle is 12 centimeters Find the perimeter of the triangle.

$\sin 60 = \frac{12}{s}$ $s(\sin 60) = 12$ $s = \frac{12}{\sin 60}$ $= 13.9$ $P = 13.9 + 13.9 + 13.9$ $= 41.7$ cm

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



$\sin 45 = \frac{h}{16}$ $16\sin 45 = h$ $11.3 = h$ $A = \frac{1}{2}(11.3)(11.3)$ $= 63.8$ cm^2

Area of Polygons and Circles

a) Circumference Formula: $C = 2\pi r$

b) Area Formula: $A = \pi r^2$

19. 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°

20. 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°.

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

$180n - 360 = 162n$

$-360 = -18n$

$20 = n$

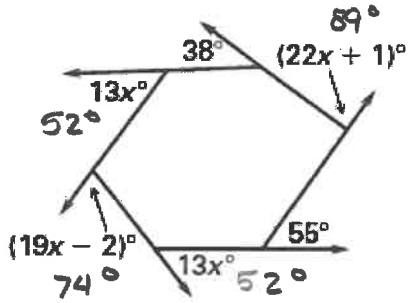
b) Each exterior angle of the regular n-gon has a measure of 5°.

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

$360 = 5n$

$72 = n$

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



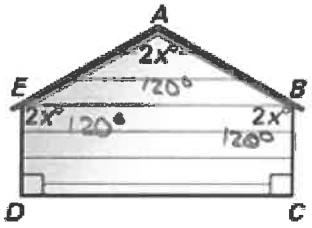
$360 = 38 + 22x + 1 + 55 + 13x + 19x - 2 + 13x$

$360 = 92 + 67x$

$268 = 67x$

$4 = x$

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



$(5-2)180 = 540°$

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

$360 = 6x$

$60 = x$

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

$A = 64\pi$

$64\pi = \pi r^2$

$64 = r^2$

$8 = r$

$C = 2\pi(8)$

$= 16\pi$ mi

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

$C = 6\pi$

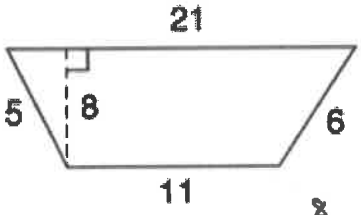
$6\pi = 2\pi r$

$3 = r$

$A = \pi(3)^2$

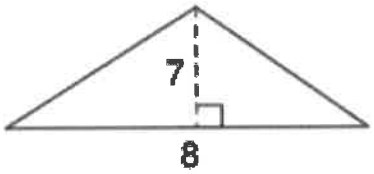
$= 9\pi$ yd^2

25. Find the area of the figures below:



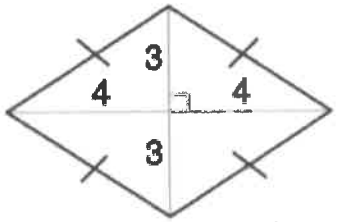
$A = \frac{8}{2}(11+21)$

$= 128\ u^2$



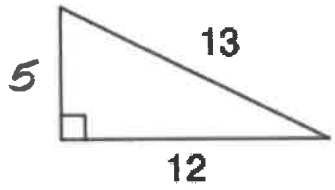
$A = \frac{1}{2}(8)(7)$

$= 28\ u^2$



$A = \frac{1}{2}(6)(8)$

$= 24\ u^2$

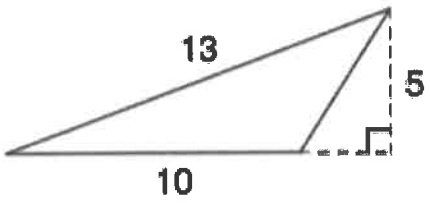


$12^2 + x^2 = 13^2$

$x = 5$

$A = \frac{1}{2}(12)(5)$

$= 30\ u^2$



$A = \frac{1}{2}(10)(5)$

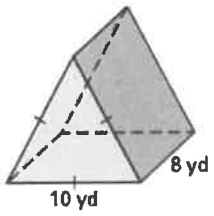
$= 25\ u^2$

26. Define a polyhedron.

a solid in 3d w/ flat polygon faces

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

a)

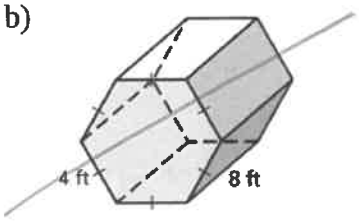


$V = Bh$

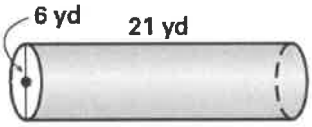
$= \frac{\sqrt{3}}{4}(10)^2(8)$

$= 346.4\ yd^3$

b)



c).



$V = Bh$

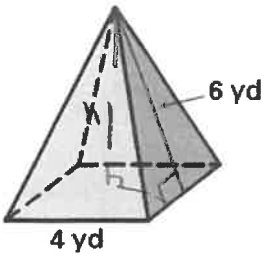
$= \pi r^2 h$

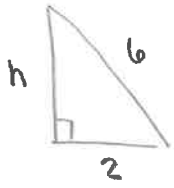
$= \pi(3)^2(21)$

$= 189\pi\ yd^3$

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

a)





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

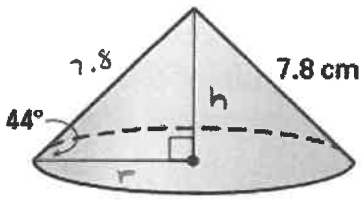
$h = \sqrt{32}$

$V = \frac{1}{3}(4)(4)h$

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

$= 30.2\ yd^3$

b)



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

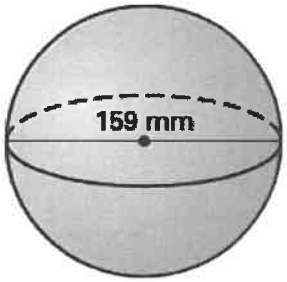
$7.8\cos 44 = r$

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

$7.8\cos 44 \approx 5.6$

$5.6^2 + h^2 = 7.8^2$

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



$r = 79.5$

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

$= 669946.5\pi\ mm^3$

$S = 4\pi(79.5)^2$

$= 25281\pi\ mm^2$

30. 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.

31.

What is the ratio of the height of the larger cylinder to the height of the smaller cylinder?

What is the ratio of the radius of the larger cylinder to the radius of the smaller cylinder?

Find the ratio of the circumference of the bases.

Find the ratio of the surface areas of the cylinders.

Find the ratio of the volumes of the cylinders.