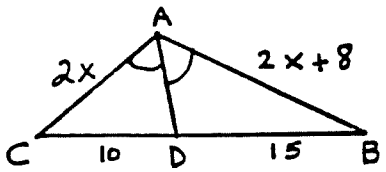
GEOMETRY FINAL EXAM: REVIEW

Name _____

PLEASE SHOW ALL WORK.

1. The measure of each interior angle of a regular polygon is 14 times the measure of an exterior angle. How many sides does the polygon have?

2. If $\overrightarrow{AD}$ bisects $\angle CAB$, find the value of x. (see diagram)



3. Trapezoid TRAP has bases TR = y + 7 and AP = 3y + 5. If the median of TRAP has length 6y - 10, find the value of y.

4. Find the measure of the angle formed by the hands of a clock at 10 o'clock. Give 2 different times in which the hands of a clock form a 120 degree angle.

5. The legs of an isosceles trapezoid are 13 cm and the bases are 14 cm and 24 cm. Find the area of the trapezoid.

6. Find the perimeter of a triangle with vertices X(3,0), Y(7,4), Z(10,0).

7. In circle O with radius 6, m $\overset{\frown}{EF}$ = 60°. Find the length of $\overset{\frown}{EF}$ and the area of sector EOF.

8. In $\square$PQRS, m$\angle$P = 4x -3 and the m$\angle$Q = 6x - 17. Find the measure of each of the angles of the parallelogram.

9. Find the lateral area, total area, and volume of a rectangular solid with length 8, width 5, and height 4.

10. ABCD is a quadrilateral with AB || DC and $\angle B$ and $\angle D$ are supplementary. Is this sufficient to prove that $\overline{AD} \parallel \overline{BC}$? Give a reason.

11. A $30^\circ - 60^\circ - 90^\circ$ triangle has legs length 8 and $8\sqrt{3}$. Find the perimeter.

12. Write an equation in standard form of the line through (6, -4) with slope $-\frac{1}{2}$.

13. Given $\triangle TRY \sim \triangle NOW$. The area of $\triangle TRY$ is 630, the area of $\triangle NOW$ is 25.2, and OW = 12.6. Find RY.

14. What is the area of a circle inscribed in a square of side length 14?

15. Find the area of an equilateral triangle with apothem $2\sqrt{3}$.

16. $\triangle RST$ has vertices R(-2,4), S(5,3), and T(-3,1). What is the length of the median to side $\overline{ST}$?

17. Write an equation in standard form of the line through (4,5) that is parallel to 2x - 4y = 7.

18. JKLM is a parallelogram with diagonals intersecting at N. If MN = 4x - 2y, JN = 5x - 3y, NK = 8, and NL = 7, find the values of x and y.

19. The measure of two angles of a triangle are 58° and 62°. What is the measure of the **largest** exterior angle?

20. In $\triangle ABC$, $m\angle C = 90^\circ$, $m\angle B = 28^\circ$, and AB = 43. Find AC and CB to the nearest tenth.

21. The altitude to the hypotenuse of a right triangle divides the hypotenuse into segments of lengths 3 and 9. Find the lengths of the altitude and the legs. Express radicals in simplest form.

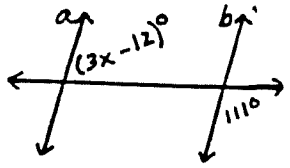
22. Write the equation of the circle that has center (2,4) and passes through the point (6,7).

23. Is a triangle with sides length 18,22, and 26 acute, right or obtuse? Give a reason.

24. Find the area of a square inscribed in a circle with radius 6.

25. X is a point on circle O with radius 14. If $\overline{XY}$ is tangent to circle O and OY = 22, find XY in simplest radical form.

26. Find the value of x that makes a||b.



27. In triangle ABC, $m\angle A = 6x + 12$, $m\angle B = 3x + 4$ and $m\angle C = 7x + 4$. Name the longest side of the triangle and give its length.

28. What is the first step of an indirect proof of the statement "In scalene $\triangle EFG$, $m\angle E \neq m\angle G$" ?

29. A triangle has side lengths 8, 12, and 14. Find the measure of the largest angle. Round off to the nearest tenth.

30. $\triangle ABC$ has vertices A=(2,1) B=(2,4) and C=(3,1) Find the image of $\triangle ABC$ under each transformation given below:

a) reflection about the y-axis _____, _____, _____

b) rotation 90° counter clockwise _____, _____, _____

c) translation 1 left and 2 down. _____, _____, _____

d) reflection about the y=x line. _____, _____, _____

1. Find the distance between the points (5, 3) and (2, 1). _____

2. Find the center and radius of the circle $(x + 1)^2 + (y - 3)^2 = 25$.

   Center _____ Radius _____

3. Write an equation of the circle with center (2, 5) and radius 3. _____

Find the slope of the line described.

4. the line through (−1, −2) and (3, 6) _____

5. a line parallel to the line through (1, 3) and (4, −1) _____

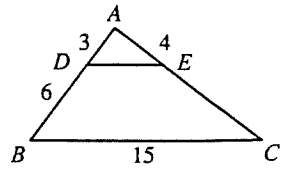
6. a line perpendicular to the line $y = 2x + 4$ _____

7. In the figure, $\triangle ABC \sim \triangle ADE$.

   a. The perimeter of $\triangle ABC$ is _____ and the perimeter of $\triangle ADE$ is _____.

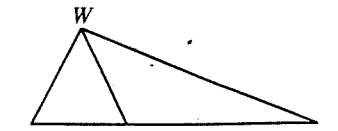
   b. The ratio of their perimeters is _____.

   c. The ratio of their areas is _____.



Ex. 7

8. The ratio of the areas of $\triangle WXY$ and $\triangle WYZ$ is _____.

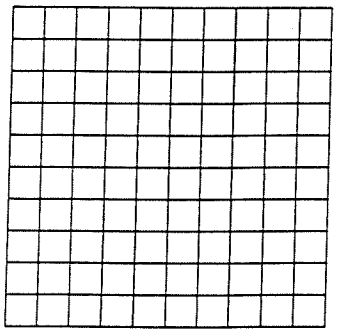


Ex. 8

9. The midpoint of the segment joining the points (6, 3) and (4, −2) is _____.

10. If $M(3, -6)$ is the midpoint of $\overline{XY}$ and $X = (1, -2)$, then $Y =$ _____.

11. Graph the lines $2x - y = 5$ and $x - 3y = 5$ and label their intersection. Use the grid at the right.


Ex. 11

Write an equation of the line described.

12. line with slope $-\frac{2}{3}$ and y-intercept 5 _____

13. line through (−1, 3) and (2, 4) _____

14. line through (−2, 4) with slope $\frac{1}{2}$ _____

15. line parallel to the y-axis through (−5, −3) _____

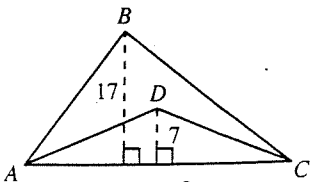
16. line through the origin and parallel to the line $4x - y = 8$ _____

17. If three vertices of a rectangle are (−5, 1), (3, 1) and (3, −2), then the fourth vertex is _____.

18. The ratio of the areas of $\triangle ABC$ and $\triangle ADC$ is _____.

19. Two similar polygons have scale factor 3 : 5. The area of the larger polygon is 125.

    The area of the smaller polygon is _____.



Ex. 18

ANSWER KEY: GEOM FINAL EXAM REVIEW **1–30**

1. $n = 30$
2. $x = 8$
3. $y = 4$
4. 60°; varies ex. 4:00 & 8:00
5. $A = 228 \text{ cm}^2$
6. $12 + 4\sqrt{2}$ units
7. $2\pi; 6\pi$
8. $\measuredangle P = \measuredangle R = 77$; $\measuredangle Q = \measuredangle S = 103$
9. $LA = 104 \text{ u}^2$; $TA = 184 \text{ u}^2$; $V = 160 \text{ u}^3$
10. no
11. $24 + 8\sqrt{3}$ units
12. $x + 2y = -2$
13. $RY = 63$
14. $49\pi \text{ u}^2$
15. $36\sqrt{3} \text{ u}^2$
16. $RM = \sqrt{13}$
17. $x - 2y = -6$
18. $x = 5$; $y = 6$
19. 122°
20. $AC = 20.2$; $CB = 38.0$
21. altitude $= 3\sqrt{3}$; legs 6, $6\sqrt{3}$
22. $(x - 2)^2 + (y - 4)^2 = 25$
23. Acute $\triangle$. The longest side is $c = 26$ and $26^2 < 18^2 + 22^2$ so acute $\triangle$ ($c^2 < a^2 + b^2$)
24. $A = 72 \text{ u}^2$
25. $12\sqrt{2}$
26. $x = 27$
27. AB; not possible to give length
28. Assume temporarily that $m\measuredangle E = m\measuredangle G$.
29. 86.4° by Law of Cosines.
30. a) $A' = (-2, 1)$ $B' = (-2, 4)$ $C' = (-3, 1)$
    b) $A' = (-1, 2)$ $B' = (-4, 2)$ $C' = (1, 3)$
    c) $A' = (1, -1)$ $B' = (1, 2)$ $C' = (2, -1)$
    d) $A' = (1, 2)$ $B' = (4, 2)$ $C' = (1, 3)$

1. Find the distance between the points (5, 3) and (2, 1). $\sqrt{13}$

2. Find the center and radius of the circle $(x + 1)^2 + (y - 3)^2 = 25$.
   Center $(-1, 3)$ Radius 5

3. Write an equation of the circle with center (2, 5) and radius 3. $9 = (x-2)^2 + (y-5)^2$

Find the slope of the line described.

4. the line through $(-1, -2)$ and $(3, 6)$ 2

5. a line parallel to the line through (1, 3) and (4, −1) $-\frac{4}{3}$

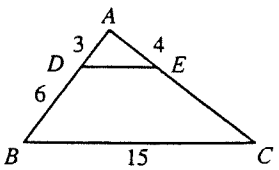
6. a line perpendicular to the line $y = 2x + 4$ $-\frac{1}{2}$

7. In the figure, $\triangle ABC \sim \triangle ADE$.

   a. The perimeter of $\triangle ABC$ is 36 and the perimeter of $\triangle ADE$ is 12.

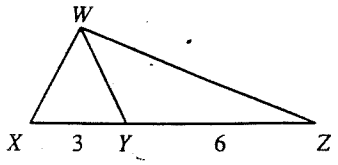
   b. The ratio of their perimeters is $1:3$.

   c. The ratio of their areas is $1:9$.



Ex. 7

8. The ratio of the areas of $\triangle WXY$ and $\triangle WYZ$ is $\frac{1}{2}$.

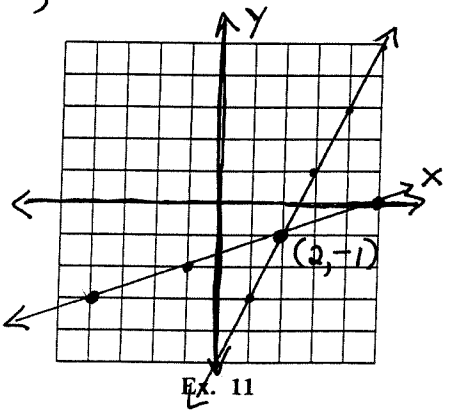


Ex. 8

9. The midpoint of the segment joining the points (6, 3) and (4, −2) is $(5, \frac{1}{2})$.

10. If $M(3, -6)$ is the midpoint of $\overline{XY}$ and $X = (1, -2)$, then $Y = (5, -10)$

11. Graph the lines $2x - y = 5$ and $x - 3y = 5$ and label their intersection. Use the grid at the right.



Ex. 11

Write an equation of the line described.

12. line with slope $-\frac{2}{3}$ and y-intercept 5 $y = \frac{-2}{3}x + 5$

13. line through $(-1, 3)$ and $(2, 4)$ $y - 4 = \frac{1}{3}(x-2)$ etc...

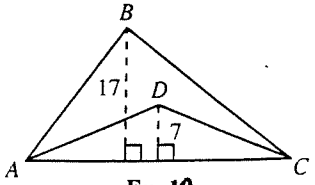
14. line through $(-2, 4)$ with slope $\frac{1}{2}$ $y - 4 = \frac{1}{2}(x+2)$

15. line parallel to the y-axis through $(-5, -3)$ $x = -5$

16. line through the origin and parallel to the line $4x - y = 8$ $y = 4x$

17. If three vertices of a rectangle are $(-5, 1)$, $(3, 1)$ and $(3, -2)$, then the fourth vertex is $(-5, -2)$

18. The ratio of the areas of $\triangle ABC$ and $\triangle ADC$ is $17:7$.



Ex. 18

19. Two similar polygons have scale factor 3 : 5. The area of the larger polygon is 125.
    The area of the smaller polygon is 45.

$$\frac{9}{25} = \frac{x}{125}$$