Name _____ School _____

KCATM **Geometry 9 – 10** **2013**

1) Find the minimum perimeter of a rectangle whose area is 169 square meters.

a) 42 meters

b) 13 meters

c) 26 meters

d) 52 meters

2) Find the coordinates of the midpoint of the segment with endpoints $D(6, 6)$ and $E(-2, 2)$.

a) (3, 4)

b) (2, 4)

c) (4, 8)

d) (1, -1)

3) If $\angle CAT$ and $\angle DAT$ form a linear pair and $\angle CAT$ is acute, then $\angle DAT$ is what kind of angle?

a) Acute

b) Right

c) Obtuse

d) Straight

4) If $\angle A \cong \angle B$, $m\angle A = 4x - 7$, and $m\angle B = 3x + 3$, find $m\angle A$.

a) 33

b) 10

c) 30

d) 47

5) Find $m\angle RSU$ if $\overrightarrow{ST}$ bisects $\angle RSU$, $m\angle RST = 4x - 12$, and $m\angle TSU = 2x + 6$.

a) 48

b) 18

c) 9

d) 24

6) What is the measure of $\overline{AD}$ if B and C are between A and D, $\overline{AB} = 6$, $\overline{AC} = 13$, $\overline{BD} = 15$, and $\overline{CD} = 8$.

a) 19

b) 21

c) 28

d) 42

7) Which of the following points does not lie on the line $y = -4x + 20$?

a) (2, 12)

b) (-3, 32)

c) (0, 20)

d) (4, 36)

8) Which conjecture is always true based on the given information?

Given: $\angle S$ is complementary to $\angle T$. $\angle S$ is complementary to $\angle R$.

a) $\angle T$ is complementary to $\angle R$.

b) $\angle T \cong \angle R$

c) $\angle T$ is adjacent to $\angle R$.

d) None of these

9) The measure of an angle is 8 more than three times the measure of its supplement. Find the measures of both angles.

a) 2°, 178°

b) 127°, 53°

c) 135°, 45°

d) 137°, 43°

10) How many degrees are in the angle formed by the hands of a clock at 5 o'clock?

a) 36°

b) 50°

c) 150°

d) 165°

11) Find the slope of any line parallel to the line passing through $G(2, -3)$ and $H(-1, 4)$.

a) -7/3

b) 3/7

c) 1/3

d) -1/3

12) A right triangle must be:

a) Isosceles

b) Acute

c) Scalene

d) Either isosceles or scalene

13) Find the measure of the sides of equilateral ΔPQR if $PQ = 5x - 7$ and $PR = 2x + 5$.

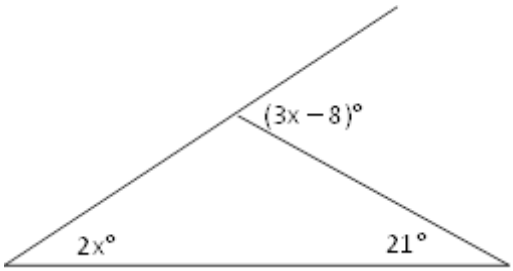
a) 39

b) 13

c) 12

d) 4

14) Find the value of x.



a) 29

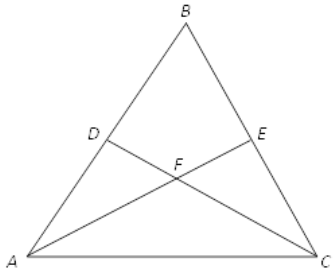
b) 55

c) 84

d) 86

15) Determine which triangles are congruent under the given conditions:

$\angle BAC \cong \angle BCA$, $\angle DCA \cong \angle EAC$



a) $\Delta ADF \cong \Delta CEF$

b) $\Delta AEC \cong \Delta CDA$

c) $\Delta BCD \cong \Delta BAE$

d) All of these

16) In isosceles ΔPQR, $\angle P$ is the vertex angle. If $m\angle Q = 8x - 3$ and $m\angle R = 2x + 15$, find the measure of $\angle P$.

a) 3

b) 21

c) 42

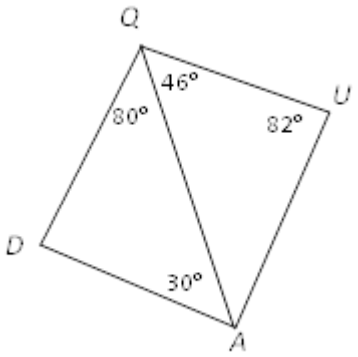
d) 138

17) You jog ¾ mile due north, then jog 1 ½ miles due east, and then return to your starting point via a straight line. Approximately how far have you jogged?

a) 2.25 miles
b) 3.75 miles
c) 3.9 miles
d) 4.3 miles

18) Find the longest side of the figure *QUAD*.

a) $\overline{DQ}$
b) $\overline{QU}$
c) $\overline{UA}$
d) $\overline{DA}$



19) One way to prove that a quadrilateral is a parallelogram is to show that:

a) it has one pair of congruent sides.
b) it has one pair of parallel sides.
c) the diagonals bisect each other.
d) the diagonals are congruent.

20) If a diagonal of *MNOP* divides *MNOP* into two equilateral triangles, what kind of figure must *MNOP* be?

a) Isosceles trapezoid
b) Rhombus
c) Square
d) None of these

21) A square window has an area of 729 square inches. Find the perimeter of the window.

a) 54 inches
b) 108 inches
c) 364.5 inches
d) 2916 inches

22) A parallelogram has a height that is 2 inches less than the length of the base. The area of the parallelogram is 168 square inches. Find the height.

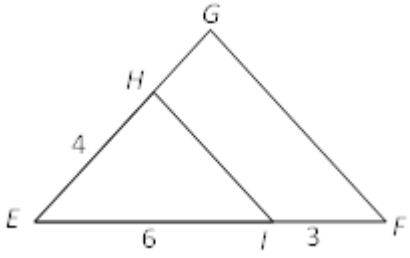
a) 14 inches
b) 10 inches
c) 12 inches
d) 16 inches

23) A 10-foot tree casts a 4.5-foot shadow. How tall is a tree that casts a 27-foot shadow at the same time of day?

a) 12.15 feet
b) 21.5 feet
c) 60 feet
d) 75 feet

24) In ΔEFG, $\overline{HI} \parallel \overline{GF}$. If $EI = 6$, $IF = 3$, and $EH = 4$, find HG.

a) 2
b) 3
c) 6
d) 10



25) Suppose ΔABC is similar to a triangle whose sides have lengths 3, 7, and 6. Which of the following could be the perimeter of ΔABC?

a) 8
b) 16
c) 32
d) Any of these

26) If each of the equal angles of an isosceles triangle measure 59°, find the measure of the third angle.

a) 60.5°
b) 62°
c) 118°
d) 121°

27) Find the length of a diagonal of a cube that has edges of length 6 inches.

a) $6\sqrt{5}$ inches
b) $3\sqrt{6}$ inches
c) $6\sqrt{3}$ inches
d) 6 inches

28) Last year, Bob's Auto Supplies sold 120 air filters out of a total of 3000 items sold. Bob will show his sales in a circle graph. Find the measure of the central angle that will represent the air filter category.

a) 345.6°
b) 144°
c) 25°
d) 14.4°

29) Find the sum of the measures of the interior angles of a convex 16-gon.

a) 2880
b) 2520
c) 2700
d) 3240

30) Which of these regular polygons will tessellate?

a) Dodecagon
b) Hexagon
c) Decagon
d) 15-gon

31) If the area of a circle is 40π square centimeters, find the radius.

a) 10 cm
b) $\sqrt{20}$ cm
c) 20 cm
d) $\sqrt{40}$ cm

32) Which is larger: the area of a circle 6 cm in diameter or the area of a square whose side is 6 cm? How much larger?

a) The circle by 77.04 square centimeters
b) The square by 77.04 square centimeters
c) The circle by 7.74 square centimeters
d) The square by 7.74 square centimeters

33) The volume of a cube is 125 cubic inches. Find the surface area.

a) 25 square inches
b) 100 square inches
c) 150 square inches
d) 625 square inches

34) Jon placed a cubical stone block with 12-inch edges in a water-filled cube with edges 15 inches long. How much water is displaced?

a) 1728 cubic inches
b) 1647 cubic inches
c) 27 cubic inches
d) 180 cubic inches

35) Tennis balls are packaged three to a cylindrical can. If the diameter of a tennis ball is 2 ½ inches, find the volume of the can.

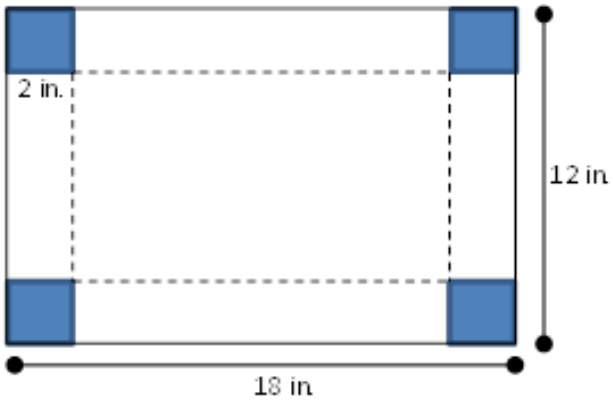
a) 8.18 cubic inches
b) 12.27 cubic inches
c) 24.64 cubic inches
d) 36.80 cubic inches

36) Find the length of the longest object that will fit inside a rectangular box 4 feet long, 3 feet wide, and 2 feet tall.

a) 4 feet
b) 4.4 feet
c) 5 feet
d) 5.3 feet

37) From a 12-inch by 18-inch piece of cardboard, 2-inch square corners are cut out as shown, and the resulting flaps are folded up to form an open box. Find the volume of the box.

a) 224 cubic inches
b) 320 cubic inches
c) 384 cubic inches
d) 432 cubic inches



38) Which of the following always has a line of symmetry?

a) Trapezoid
b) Parallelogram
c) Triangle
d) Rectangle