

Geometry Final Review 6/17/16

1) In right triangle ABC, $\angle B$ is a right angle, $AC = 13$, and $AB = 12$. Which of the following would always be true?

1) $\tan A = \frac{12}{5}$ 2) $\tan C = \frac{12}{5}$ 3) $\sin C = \frac{5}{13}$ 4) $\sin A = \frac{12}{13}$

2) In right triangle ABC, $\angle B$ is the right angle. $AC = 10$ and $BC = 4$. Which of the following would be true?

a) $\sin C = \frac{4}{10}$ 2) $\cos A = \frac{4}{10}$ 3) $\sin A = \frac{\sqrt{84}}{10}$ 4) $\tan C = \frac{\sqrt{84}}{4}$

3) Right triangle ABC has right angle A and AB is twice as long as AC. Which of the following is true?

1) $\tan B = \tan C$ 2) $\sin C = \sin B$ 3) $\cos C = \sin C$ 4) $\cos C = \sin B$

4) Segment AB has endpoints A(-1, 2) and B(1, -1). Segment CD is perpendicular to segment AB and has point C(-3, -1). Which of the following points could be point D if $CD:AB = 2:1$?

1) (3, 3) 2) (-1, -4) 3) (0, 1) 4) (0, .5)

5) Segment AC has endpoints A(-4, 6) and C(10, 28). Find point D on this segment such that $DC:DA = 3:2$.

1) (1.6, 14.8) 2) (4.4, 19.2) 3) (-1.2, 10.4) 4) (7.2, 23.6)

6) Segment SW has endpoints S(-8, -10) and W(12, 32). Find point P on this segment such that $SP:WP = 2:3$.

1) (0, 6.8) 2) (-4, -1.6) 3) (8, 23.6) 4) (4, 15.2)

7) Segment SL has endpoints S(2, 4) and L(14, 18). Find point W between points S and L such that $SW:WL = 3:1$.

8) In a triangle, A(1, 2), B(3, 4) and C(4, 0). A dilation with scale factor $\frac{1}{2}$ is performed which is centered at (2, 1). Which of the following is not true?

1) Area of $\triangle ABC$: Area of $\triangle A'B'C' = 4:1$
2) Perimeter of $\triangle ABC$: Perimeter of $\triangle A'B'C' = 2:1$
3) A'(1.5, 1), B'(1.5, 2), C'(2, 0)
4) A'(1.5, 1.5) B'(2.5, 2.5), C'(3, .5)

9) If you are dilating $y = 2x - 1$ with a scale factor of $\frac{1}{2}$ centered at (3, -1) what would be the equation of the resulting line?

1) $y = 2x - \frac{1}{2}$ 2) $y = 1x - \frac{1}{2}$ 3) $y = 2x - 4$ 4) $y = 2x - 7$

10) Triangle ABC has points A(-2, 2), B(1, 3) and C(2, -1). A dilation with scale factor $\frac{1}{2}$ is performed centered at (-3, -1). Find the coordinates of triangle A'B'C'

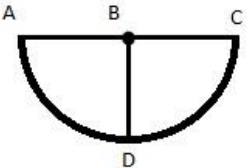
11) If you needed to construct a regular 18 sided polygon, what would the central angle be that you would need to create?

- 1) 60° 2) 45° 3) 20° 4) 18°

12) Construct a parallelogram that is not a rhombus below that has at least one 30° angle in the space below.

13) If you were constructing an inscribed regular octagon what would the measure of the arcs between two consecutive points of the octagon be?

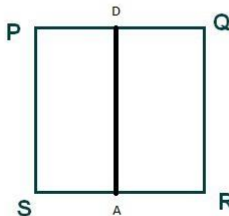
- 1) 45° 2) 60° 3) 120° 4) 90°

14)  In the following diagram $AB = BC = BD$ and $\overline{AC} \perp \overline{BD}$. If this shape is rotated continually around AC what would be created?

1) circle 2) cone 3) cylinder 4) sphere

15) In the diagram for #13, $AB = BC = BD = 5\text{in}$ and $\overline{AC} \perp \overline{BD}$. If this shape was rotated continually around segment BD what would the volume of the resulting figure be?

- 1) $\frac{250}{3}\pi$ 2) $\frac{500}{3}\pi$ 3) $\frac{25}{2}\pi$ 4) 25π

16)  PQRS is a parallelogram with $PQ = QR$ and $\overline{PQ} \perp \overline{QR}$. If $PQ = 10\text{in}$ and PQRS is rotated continually around \overline{DA} what would the resulting volume be (D and A are midpoints of their respective sides)?

17) A spherical water tower is designed to hold 6,500,000 pounds of water. The water tower has a diameter of 60ft and is 80% full of water, what percentage of its allowed weight is it currently holding (water weighs 62.4 pounds per cubic foot)?

- 1) 80% 2) 87% 3) 6.9% 4) 14%

18) A cone and a cylinder have the same height. The diameter of the cone is 10cm and the radius of the cylinder is equal to the diameter of the cone. If the cone is filled with water and poured into the cylinder, what percentage of the cylinder remains empty?

- 1) 91.7% 2) 8.3% 3) 26.2% 4) 73.8%

19) A candle which is in the shape of a cone has a height of 12in and radius of 8in. It is burned from the apex such that 4 inches of the height is gone. What fraction of the original cones volume remains?

20) A segment has endpoints (7, -2) and (4, -1). Which would be the equation of the perpendicular bisector of this segment?

- 1) $y = 3x - 23$ 2) $y = 3x - 13$
3) $y = -\frac{1}{3}x + \frac{13}{3}$ 4) $y = 3x - 18$

21) In rhombus ABCD, A(4, 1) and C(12, 4). Find the equation of the line that would pass through B and D.

- 1) $y = \frac{3}{8}x - \frac{1}{2}$ 2) $y = -\frac{8}{3}x + \frac{143}{6}$
3) $y = -\frac{8}{3}x + \frac{35}{3}$ 4) $y = -\frac{8}{3}x + 33$

22) 30,000 bacteria are living in an isosceles triangle that has a base 10mm and a leg of 14mm. What is the density of these bacteria?

- 1) 428.6 2) 459.0 3) .0023 4) .0022

23) A cube has density 2.5 grams per cubic centimeter. If the cube weighs 1822.5 grams, what would the surface area of the cube be?

24) Which has a greater density, a cube that weighs 468kg that has a face with area 73 square inches or a cylinder that weighs 369kg with height 9.5 inches and radius .35ft?

25) Two similar triangles have corresponding sides represented by $2x + 4$ and $3x + 3$. The areas of these two similar triangles are 81 and 144. What is the side represented by $2x + 4$?

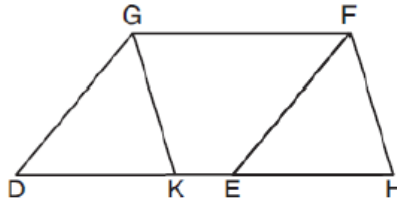
- 1) 25.2 2) 24 3) 18.8 4) 18

26) Two triangles are similar, the height of the smaller triangle is 2, the height of the larger triangle is 18. If the area of the smaller triangle is 7, what is the area of the larger triangle?

27) [4] Two triangles are similar. Corresponding sides are represented by $2x + 3$ (smaller) and $6x - 9$ (larger). The areas of these triangles are 25 and 81. What would be the measurement of the side of the larger triangle that corresponds with the side of the smaller triangle that is represented by $2x - 2$?

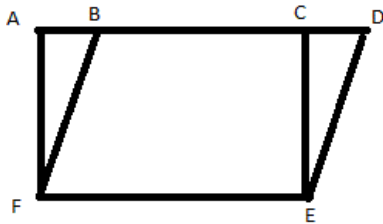
28)

Given: Parallelogram $DEFG$, K and H are points on \overline{DE} such that $\angle DGK \cong \angle EFH$ and \overline{GK} and \overline{FE} are drawn



Prove: $GFHK$ is a parallelogram

29)



Given: $BDEF$ is a parallelogram

$$\overline{FA} \perp \overline{AD}$$

$$\overline{CE} \perp \overline{AD}$$

Prove: $ACEF$ is a parallelogram

30) Triangle ABC has points $A(-5, 2)$, $B(2, 1)$, and $C(7, 7)$. Prove what type of triangle this is (2 names). Where could point D be placed so that $ABCD$ is a parallelogram (prove that figure is a parallelogram).

31) If a circle has a center point located at $(-4, 1)$ and a radius of 4 which of the following would be the equation of this circle?

1) $x^2 - 8x + y^2 + 2y = -1$

2) $x^2 + 8x + y^2 - 2y = -1$

3) $x^2 - 4x + y^2 + 1y = 16$

4) $x^2 + 4x + y^2 - 1y = 16$

32) If a circle has the equation $x^2 + 7x + y^2 - 9y - 2 = 0$ what would the length of the diameter be to the nearest hundredth?

33) If a circle passes through (5, 5) and has a center located at (2, 1) which would be the proper equation of this circle?

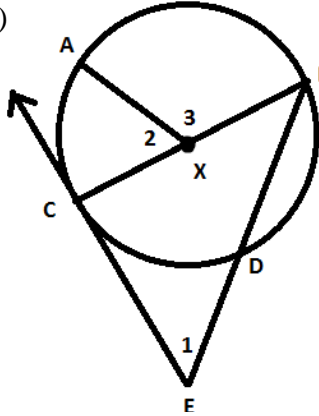
1) $x^2 + 2x + y^2 + 1y = 25$

2) $x^2 - 2x + y^2 - 1y = 25$

3) $x^2 + 4x + y^2 + 2y = 20$

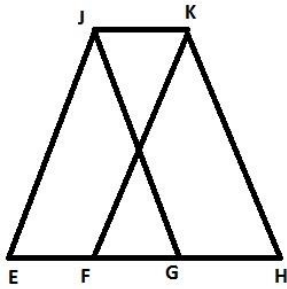
4) $x^2 - 4x + y^2 - 2y = 20$

34)



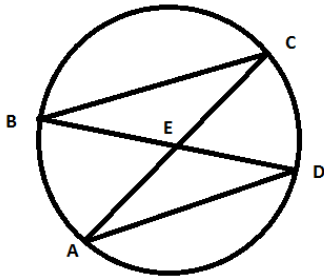
In the following diagram, $m\widehat{AB} = 110^\circ$, $m\widehat{BD} = 85^\circ$, and X is the center of the circle. \overrightarrow{EC} is a tangent. Find $m\angle CED$ and explain how you came to this answer.

35)



JKHE is an isosceles trapezoid. $m\angle HKJ = 110^\circ$ and $m\angle GJE = 40^\circ$. Is triangle JGE an isosceles triangle (explain your answer).

36)



E is the center of this circle. $m\angle CBE = 32^\circ$ and the area of the circle is $49\pi m^2$. Find the length of arc BC to the nearest tenth of a meter.

37) Using the diagram for #36, the length of arc CD is 15mm. The area of the circle is $900\pi mm^2$. Find $m\angle BEC$ to the nearest degree.

38) A regular octagon has one side with endpoints (-1, -4) and (3, 4). What would be the perimeter of this octagon in simplest radical form?

39) If two endpoints of the diameter of a circle are $(-2, 4)$ and $(8, 12)$ what would be the length of the radius in simple radical form?