

Key

**Math I EOC Review**  
**G-GPE.4, G-GPE.5, G-GPE.6, G-GPE.7, G-GMD.3**

Distance Formula  $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Midpoint Formula  $(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$

Slope  $\frac{y_2 - y_1}{x_2 - x_1}$

Perimeter – add up all the sides

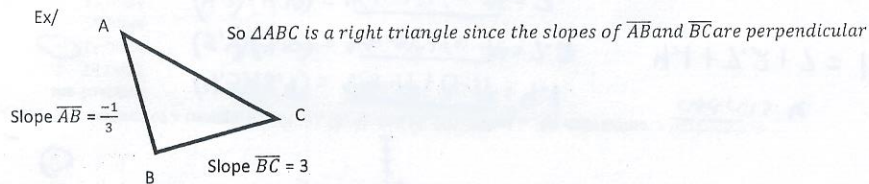
Parallel – Same slope

Perpendicular – flip the slope and change the sign

Ex/ The perpendicular slope to  $\frac{-2}{3}$  is  $\frac{3}{2}$ . The perpendicular slope to 5 (since 5 is the same as  $\frac{5}{1}$ ) is  $\frac{-1}{5}$ .

The distance from the center of a circle to any point that lies on the circle is the radius.

A right triangle is defined as a triangle with 2 sides that are perpendicular.



Area of a triangle:  $\sqrt{s(s - \text{side } 1)(s - \text{side } 2)(s - \text{side } 3)}$  where  $s$  is  $\frac{1}{2}$  of the perimeter

Properties of:

**Square**  
 4 right angles  
 4 equal sides  
 Opposite sides are parallel

**Rectangle**  
 4 right angles  
 Opposite sides are parallel and equal

**Parallelogram**  
 Opposite sides are parallel  
 Opposite sides are equal  
 Opposite angles are equal

Volume of:

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

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

Cone  $V = \frac{1}{3}\pi r^2 h$

Cylinder  $V = \pi r^2 h$  \*This is the only formula that will not be given

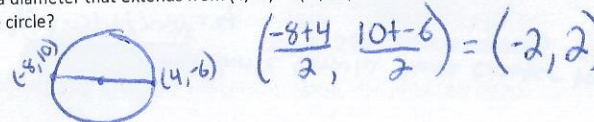
1. What is the midpoint of the line segment with endpoints at (12, 7) and (8, 3)?  
 A. (2, 2)  
 B. (4, 4)  
 C. (10, 5)  
 D. (20, 10)

$$\left(\frac{12+8}{2}, \frac{7+3}{2}\right) = (10, 5)$$

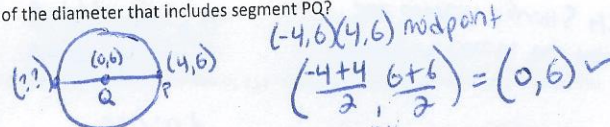
2. The endpoints of  $\overline{PQ}$  are (-2, 8) and (6, 12). What are the coordinates of the midpoint of  $\overline{PQ}$ ?  
 A. (5, 7)  
 B. (4, 10)  
 C. (4, 4)  
 D. (2, 10)

$$\left(\frac{-2+6}{2}, \frac{8+12}{2}\right) = (2, 10)$$

3. A circle has a diameter that extends from (4, -6) to (-8, 10). What are the coordinates of the center of the circle?  
 A. (-2, 2)  
 B. (-3, 6)  
 C. (-4, 4)  
 D. (-6, 8)



4. The center of a circle is at Q(0, 6). A radius is drawn from Q to P(4, 6). What are the coordinates of the endpoint of the diameter that includes segment PQ?  
 A. (0, 2)  
 B. (0, 10)  
 C. (-4, 6)  
 D. (6, -4)



5. Which is an equation of the line that passes through the point (2, 0) and is parallel to the graph of  $y = -4x + 1$ ?  
 A.  $y = -4x + 2$   
 B.  $y = -4x + 8$   
 C.  $y = -\frac{1}{4}x - \frac{1}{2}$   
 D.  $y = -\frac{1}{4}x + \frac{1}{2}$

$$y = -4x + b$$

$$0 = -4(2) + b$$

$$0 = -8 + b$$

$$+8 \quad +8$$

$$b = 8$$

6. Which equation graphs a line parallel to  $y = 2x + 1$  and has a y-intercept of -5?  
 A.  $2x + y = -5$   
 B.  $2x - y = -5$   
 C.  $2x + y = 5$   
 D.  $2x - y = 5$

$$2x - y = 5$$

$$-2x \quad -2x$$

$$-y = -2x + 5$$

$$y = 2x - 5$$

7. Which is an equation of a line perpendicular to the graph of  $x - (3y + 2) = 4$ ?  
 A.  $y = \frac{-1}{3}x + 4$   
 B.  $y = -3x + 1.5$   
 C.  $y = 3x + 2$   
 D.  $y = \frac{1}{3}x + 5$

perpendicular  
 slope to  $\frac{1}{3}$  is -3

$$x - 3y - 2 = 4$$

$$x - 3y = 6$$

$$-x \quad -x$$

$$-3y = -x + 6$$

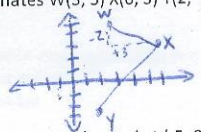
$$\frac{-3y}{-3} = \frac{-x+6}{-3}$$

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

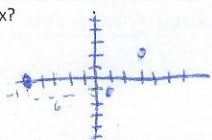
8. Which is an equation of a line that is perpendicular to the graph of  $9x - 3y = -10$ ?
- A.  $3x - y = 10$   
 B.  $4x + 12y = 11$   
 C.  $5x - 15y = 6$   
 D.  $6x + 2y = 9$

perpendicular  
 slope of 3 is  $-\frac{1}{3}$   
 opposite & flipped slope  
 $9x - 3y = -10$   
 $-\frac{3y}{-3} = \frac{-9x - 10}{-3}$   
 $y = 3x + \frac{10}{3}$   
 $4x + 12y = 11$   
 $\frac{12y}{12} = \frac{-4x + 11}{12}$   
 $y = -\frac{1}{3}x + \frac{11}{12}$

9. Rectangle WXYZ has coordinates W(3, 5) X(6, 3) Y(2, -3). What are the coordinates of point Z?
- A. (0, 0)  
 B. (0, 1)  
 C. (-1, 0)  
 D. (-1, -1)



10. Three vertices of a parallelogram are located at (-5, 0), (1, -1), and (3, 2). What are the coordinates of the fourth vertex?
- A. (-6, 2)  
 B. (-5, 2)  
 C. (-4, 3)  
 D. (-3, 3)



11. The vertices of a triangle are (4, 3), (8, 4), and (4, 10). What is the approximate perimeter of the triangle?
- A. 14 units  
 B. 18 units  
 C. 22 units  
 D. 33 units

add all side  
 $(4,3)(8,4) = \sqrt{(8-4)^2 + (4-3)^2} = 4.1$   
 $(8,4)(4,10) = \sqrt{(4-8)^2 + (10-4)^2} = 7.2$   
 $(4,3)(4,10) = \sqrt{(4-4)^2 + (10-3)^2} = 7$   
 $4.1 + 7.2 + 7 = 18.3$

12. Triangle PQR has vertices at (-3, -3), (-2, 3), and (4, -1). What is the approximate perimeter of triangle PQR?
- A. 21 units  
 B. 19 units  
 C. 15 units  
 D. 12 units

Find Perimeter first  
 $(-3,-3)(-2,3) = \sqrt{(-2-(-3))^2 + (3-(-3))^2} = 6.08$   
 $(-2,3)(4,-1) = \sqrt{(4-(-2))^2 + (-1-3)^2} = 7.21$   
 $(-3,-3)(4,-1) = \sqrt{(4-(-3))^2 + (-1-(-3))^2} = 7.28$   
 $6.08 + 7.21 + 7.28 = 20.57$

13. What is the area of a triangle with vertices at (1, 4), (5, 1), and (8, 5)?
- A. 12.5 units<sup>2</sup>  
 B. 17.5 units<sup>2</sup>  
 C. 25 units<sup>2</sup>  
 D. 35 units<sup>2</sup>

Find Perimeter first  
 $(1,4)(5,1) = \sqrt{(5-1)^2 + (1-4)^2} = 5$   
 $(5,1)(8,5) = \sqrt{(8-5)^2 + (5-1)^2} = 5$   
 $(1,4)(8,5) = \sqrt{(8-1)^2 + (5-4)^2} = 7.07$   
 $5 + 5 + 7.07 = 17.07$   
 $\frac{17.07}{2} = 8.535$   
 $\sqrt{8.535(8.535-5)(8.535-5)(8.535-7.07)} = 12.49$

14. What is the area of a triangle with vertices at (2, 4), (3, -1), and (-2, -2)?
- A. 12.7 units<sup>2</sup>  
 B. 17.3 units<sup>2</sup>  
 C. 26.2 units<sup>2</sup>  
 D. 161.9 units<sup>2</sup>

Find Perimeter first  
 $(2,4)(3,-1) = \sqrt{(3-2)^2 + (-1-4)^2} = 5.09$   
 $(3,-1)(-2,-2) = \sqrt{(-2-3)^2 + (-2-(-1))^2} = 5.09$   
 $(2,4)(-2,-2) = \sqrt{(-2-2)^2 + (-2-4)^2} = 7.21$   
 $5.09 + 5.09 + 7.21 = 17.39$   
 $\frac{17.39}{2} = 8.695$   
 $\sqrt{8.695(8.695-5.09)(8.695-5.09)(8.695-7.21)} = 12.95$

15. A balloon in the shape of a sphere has a radius of 6 inches. What is the approximate volume of the balloon? (Use  $V = \frac{4}{3}\pi r^3$ , where V is volume and r is radius.)
- A. 151 in<sup>3</sup>  
 B. 452 in<sup>3</sup>  
 C. 905 in<sup>3</sup>  
 D. 2,714 in<sup>3</sup>

$V = \frac{4}{3}\pi r^3$   
 $= 404.77$

16. The base of a square pyramid has a side length of 10 inches. The height of the prism is 12 inches. What is the volume of the pyramid? (Use  $V = \frac{1}{3}Bh$ , where B is the area of the base, and h is the height.)
- A. 480 cubic inches  
 B. 400 cubic inches  
 C. 120 cubic inches  
 D. 40 cubic inches

$10 \cdot 10 = 100$   
 $V = \frac{1}{3}(100)(12)$   
 $= 400$

17. A cone has a diameter that measures 10 cm and is 6 inches tall. What is the approximate volume, V, of the cone? (Use  $V = \frac{1}{3}\pi r^2 h$ , where r is the radius and h is the height.)
- A. 157.1 cm<sup>3</sup>  
 B. 188.5 cm<sup>3</sup>  
 C. 471.2 cm<sup>3</sup>  
 D. 628.3 cm<sup>3</sup>

$V = \frac{1}{3}\pi (5)^2 (6)$   
 $= 157.07$

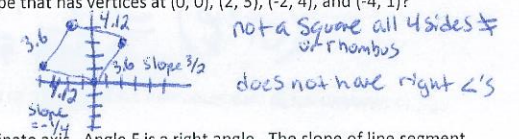
18. A cylinder has a radius of 5 cm and a volume of 471 cubic cm. What is the approximate height of the cylinder?
- A. 6 cm  
 B. 15 cm  
 C. 19 cm  
 D. 30 cm

plug in each h to see which equals 471  
 $V = \pi r^2 h$   
 $471 = \pi 5^2 \cdot h$   
 $471 = \pi 5^2 \cdot 6$

19. A circle is centered at (-5, 2) and has a radius of 4. Which point lies on the circle?
- A. (-5, -2)  
 B. (-3, 4)  
 C. (-2, -1)  
 D. (3, -3)

do distance formula from center to each point. see which equals 4  
 $\sqrt{(-5-(-2))^2 + (2-(-1))^2} = 4$

20. Which term best describes the shape that has vertices at (0, 0), (2, 3), (-2, 4), and (-4, 1)?
- A. Parallelogram  
 B. Rhombus  
 C. Rectangle  
 D. Square



21. Triangle EFG is graphed on a coordinate axis. Angle F is a right angle. The slope of line segment EF is  $-\frac{4}{5}$ . What is the slope of line segment FG?
- A.  $\frac{5}{4}$   
 B.  $\frac{4}{5}$   
 C.  $-\frac{4}{5}$   
 D.  $\frac{5}{4}$

