

Accelerated Geometry  
Sections 13-1 to 13-7 Review for Quest

I. Multiple Choice. Choose the best answer and write the letter of the answer in the space provided.

B1. Which of the following is the distance between the points  $(-1, 8)$  and  $(5, -3)$ ?

A.  $7\sqrt{3}$

B.  $\sqrt{157}$

C.  $\sqrt{41}$

D.  $4\sqrt{5}$

$$d = \sqrt{(-1-5)^2 + (8+3)^2} = \sqrt{36 + 121} = \sqrt{157}$$

A2. Which of the following a line with a slope of  $\frac{2}{5}$  that passes through the point  $(1, 4)$ ?

A.  $y - 4 = \frac{2}{5}(x - 1)$

B.  $y - 4 = \frac{5}{2}(x - 1)$

C.  $y + 4 = \frac{2}{5}(x + 1)$

D.  $y - 1 = \frac{2}{5}(x - 4)$

B3. Which of the following is a point on the line  $y = 3x + 6$ ?

A.  $(1, 3)$   
 $3 \neq 3 + 6$

B.  $(2, 12)$   
 $12 = 6 + 6 \checkmark$

C.  $(4, 7)$   
 $7 \neq 12 + 6$

D.  $(-5, -8)$   
 $-8 \neq -15 + 6$

C

4. Which of the following pairs could be the slopes of two perpendicular lines?

A.  $m = \frac{3}{2}$  and  $m = \frac{2}{3}$

B.  $m = 3$  and  $m = -3$

C.  $m = 0$  and undefined slope

D.  $m = 1$  and  $\frac{1}{2}$

C5. Which of the following lines is parallel to  $y = \frac{1}{3}x + 5$ ?

A.  $2x + 3y = 5$   
 $3y = -2x + 5$   
 $y = -\frac{2}{3}x + \frac{5}{3}$

B.  $x + 3y = 4$   
 $3y = -x + 4$   
 $y = -\frac{1}{3}x + \frac{4}{3}$

C.  $x - 3y = -12$   
 $-3y = -x - 12$   
 $y = \frac{1}{3}x + 4$

D.  $5x + 3y = 12$   
 $3y = -5x + 12$   
 $y = -\frac{5}{3}x + 4$

D6. Determine an equation of the circle whose center is at  $(0, -2)$  and whose radius is 9 units.

A.  $(x - 2)^2 + y^2 = 9$

B.  $x^2 + (y - 2)^2 = 81$

C.  $x^2 + (y + 2)^2 = 9$

D.  $x^2 + (y + 2)^2 = 81$

A7. Which of the following is the best describes a triangle with vertices  $(1, -3)$ ,  $(6, 2)$ , and  $(0, 4)$ ?

A. isosceles triangle

B. equilateral triangle

C. right triangle

D. none of these

$$AC = AB = 5\sqrt{2}$$

$$m_{AB} = \frac{2+3}{6-1} = \frac{5}{5} = 1$$

$$m_{AC} = \frac{4+3}{0-1} = -7$$

$$m_{BC} = \frac{2-4}{6-0} = -\frac{1}{3}$$

A B C

$$AC = \sqrt{(1-0)^2 + (-3-4)^2} = \sqrt{1+49} = \sqrt{50} = 5\sqrt{2}$$

$$BC = \sqrt{(6-0)^2 + (2-4)^2} = \sqrt{36+4} = \sqrt{40}$$

$$AB = \sqrt{(6-1)^2 + (2+3)^2} = \sqrt{25+25} = 5\sqrt{2}$$

**II. Fill in the blank.**

8. If two lines have the same slope, then they are parallel.
9. If two lines are perpendicular, then their slopes are opposite reciprocals.
10. A vertical line has a slope that is undefined.
11. A line with a slope of zero is a horizontal line.

**III. Answer each of the following questions. Show all of your work.**

12. Given the following points, find the slope, midpoint, and length of  $\overline{AB}$ .  $A(-2,-2)$ ,  $B(7,-6)$ .

$$m = \frac{-6+2}{7+2} = \boxed{\frac{-4}{9}}$$

$$d = \sqrt{(-2-7)^2 + (-2+6)^2} = \sqrt{81+16} = \sqrt{97}$$

$$\text{midpt} = \left(\frac{-2+7}{2}, \frac{-2+6}{2}\right) = \boxed{\left(\frac{5}{2}, -4\right)}$$

13. A line has the equation  $y = 5x + 3$ . State the slope, y-intercept, and x-intercept.

$m = 5$

y-intercept  $\boxed{(0, 3)}$

$0 = 5x + 3$   
 $-3 = 5x$   
 $\frac{-3}{5} = x$

x-intercept:  $\boxed{\left(-\frac{3}{5}, 0\right)}$

14. State whether or not the following points are collinear. If so, state which point is in the middle.

$R(-3,-1)$ ,  $S(9,8)$ , and  $T(5,5)$ .

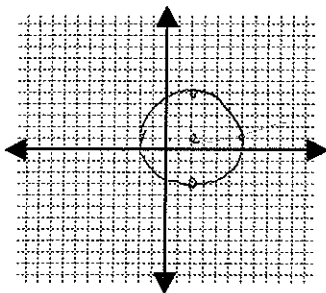
$$\frac{RS}{ST} = \frac{d = \sqrt{(-3-9)^2 + (-1-8)^2}}{\sqrt{(9-5)^2 + (8-5)^2}} = \frac{\sqrt{144+81}}{\sqrt{16+9}} = \frac{\sqrt{225}}{\sqrt{25}} = \frac{15}{5} = 3$$

$$\frac{RT}{ST} = \frac{\sqrt{(-3-5)^2 + (-1-5)^2}}{\sqrt{(9-5)^2 + (8-5)^2}} = \frac{\sqrt{64+36}}{\sqrt{16+9}} = \frac{\sqrt{100}}{\sqrt{25}} = \frac{10}{5} = 2$$

Yes Collinear  
 $ST + RT = RS$   
 $T$  is in the middle

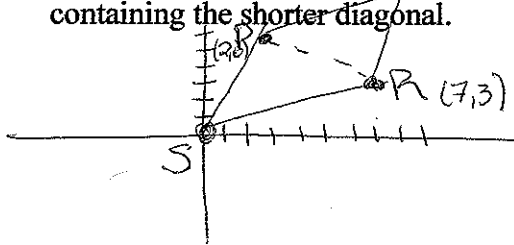
15. Write the equation of the circle with center  $(2,1)$  and radius 4 and graph it on the coordinate plane below.

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



Answer each of the following questions. Show all of your work.

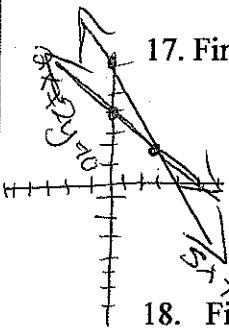
16. Parallelogram PQRS has vertices P(2,6), Q(9,9), R(7,3), and S(0,0). Find the equation of the line containing the shorter diagonal.



$$m = \frac{3-6}{7-2} = -\frac{3}{5}$$

thru pt (7,3)  $y-3 = -3/5(x-7)$  or thru (2,6)  $y-6 = -3/5(x-2)$

17. Find the point of intersection between the lines  $5x+3y=21$  and  $2x+2y=10$ . 3 Graph



$$\begin{array}{r} (5x+3y=21) \cdot 2 \\ (2x+2y=10) \cdot -3 \\ \hline 10x+6y=42 \\ -6x-6y=-30 \\ \hline 4x=12 \\ x=3 \end{array}$$

$$\begin{array}{r} 5(3)+3y=21 \\ 15+3y=21 \\ 3y=6 \\ y=2 \end{array}$$

$(3,2)$

18. Find the x-intercepts and y-intercepts of the following line  $3x+4y=12$ .

$$\begin{array}{l} 0+4y=12 \\ y=3 \end{array}$$

$(0,3)$  y intercept.

$$\begin{array}{l} 3x+0=12 \\ x=4 \end{array}$$

$(4,0)$  x intercept

19. Write the equation of a line that is parallel to the y-axis that goes through the point (9,1).

$x=9$  vertical line

20. Find the missing coordinate if  $\overline{AB}$  has slope  $\frac{1}{2}$ .  $(-1,-4)$  and  $(3,-2)$ .

$$\frac{y+4}{3+1} = \frac{y+4}{4} = \frac{1}{2}$$

$$\begin{array}{l} (y+4)2 = 4 \\ 2y+8 = 4 \\ y+4 = 2 \\ y = -2 \end{array}$$

21. If M(-3,7) is the midpoint of  $\overline{PQ}$ , where P has coordinates (9,-4), find the coordinates of Q.

$$\begin{array}{l} \frac{9+x}{2} = -3 \\ 9+x = -6 \\ x = -15 \end{array}$$

$$\begin{array}{l} \frac{-4+y}{2} = 7 \\ -4+y = 14 \\ y = 18 \end{array}$$

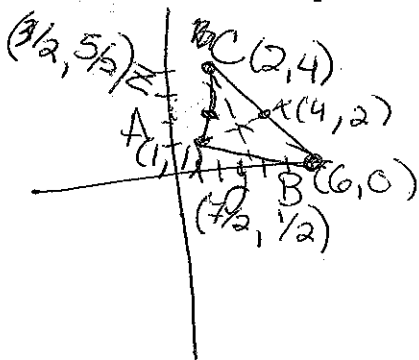
$(-15, 18)$

22. Write the equation of a line, in slope-intercept form that contains the point (-4,-6) with slope 3.

$$\begin{array}{l} y+6 = 3(x+4) \\ y+6 = 3x+12 \\ y = 3x+6 \end{array}$$

Answer each of the following questions. Show all of your work.

23. Find the equation of each line that contains a median of  $\triangle ABC$  given vertices  $A(1,1)$ ,  $B(6,0)$ ,  $C(2,4)$ .



$$m_{Ax} = \frac{2-1}{4-1} = \frac{1}{3}$$

$$\boxed{y-1 = \frac{1}{3}(x-1)}$$

$$\text{or } \boxed{y-2 = \frac{1}{3}(x-4)}$$

$$m_{Cy} = \frac{4-1/2}{2-7/2} = \frac{7/2}{-3/2} = -\frac{7}{3}$$

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

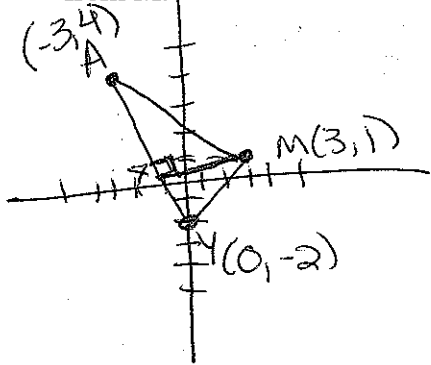
$$\text{or } \boxed{y-1/2 = -\frac{7}{3}(x-7/2)}$$

$$m_{Bz} = \frac{5/2-0}{3/2-6} = \frac{5/2}{-9/2} = -\frac{5}{9}$$

$$\boxed{y-5/2 = -\frac{5}{9}(x-3/2)}$$

$$\text{or } \boxed{y = -\frac{5}{9}(x-6)}$$

24.  $\triangle AMY$  has vertices  $A(-3,4)$ ,  $M(3,1)$ , and  $Y(0,-2)$ . Find the equation of the line containing the altitude from  $M$ .



$$m_{AY} = \frac{-2-4}{0+3} = \frac{-6}{3} = -2$$

$$\overline{AY} \perp \overline{MX}$$

$$m_{MX} = \frac{1}{2}$$

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