

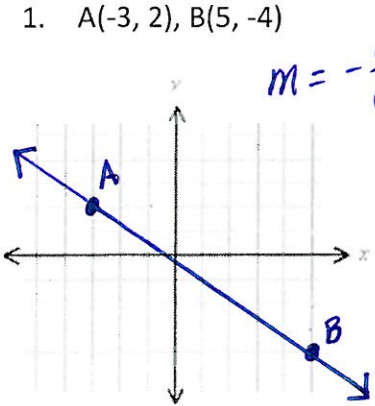
\*AAT

Chapter 3: 3-3 Lines (IC/HW) - Days 1 & 2

Name: Key  
Date: \_\_\_\_\_ Period: \_\_\_\_\_

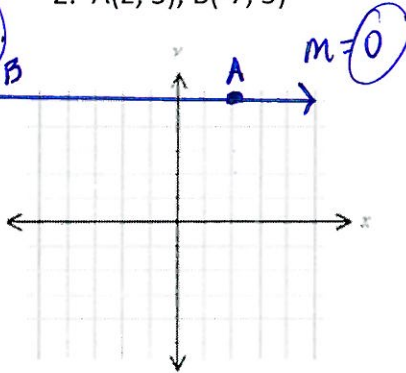
Sketch the line through A and B, and find its slope m.

1. A(-3, 2), B(5, -4)



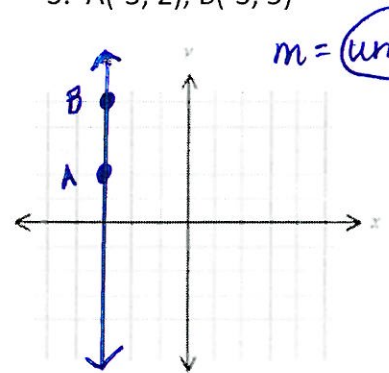
$$m = -\frac{6}{8} = -\frac{3}{4}$$

2. A(2, 5), B(-7, 5)



$$m = 0$$

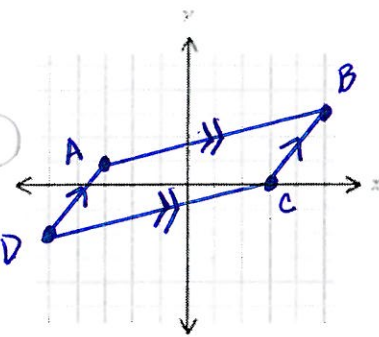
3. A(-3, 2), B(-3, 5)



$$m = \text{undefined}$$

Use slopes to show that the points are vertices of the specified polygon.

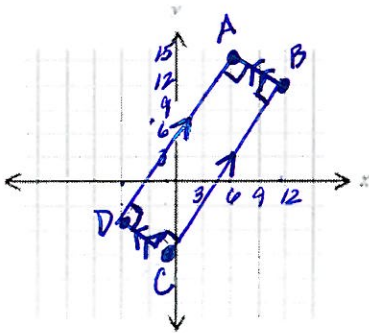
4. A(-3, 1), B(5, 3), C(3, 0), D(-5, -2); parallelogram



$$m_{AB} = \frac{1}{4} = m_{DC}$$

$$m_{DA} = \frac{3}{2} = m_{CB}$$

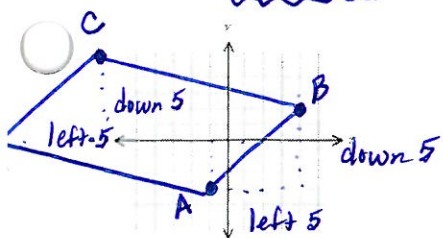
5. A(6, 15), B(11, 12), C(-1, -8), D(-6, -5); rectangle



$$m_{DA} = \frac{5}{3} = m_{CB}$$

$$m_{AB} = -\frac{3}{5} = m_{DC}$$

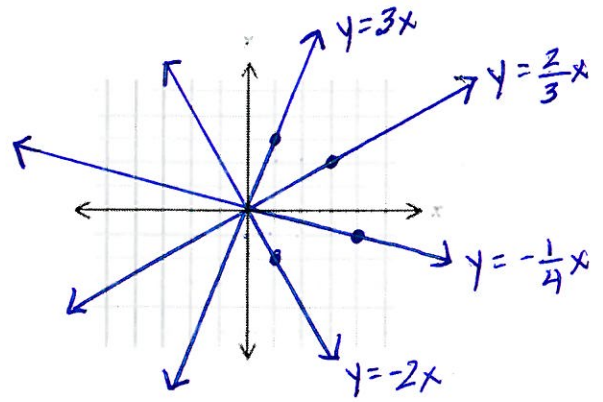
6. If three consecutive vertices of a parallelogram are A(-1, -3), B(4, 2), and C(-7, 5), find the fourth vertex.



slope from B to A (down 5, left 5)  
 so, slope from C to D (down 5, left 5)  
 $D(-12, 0)$

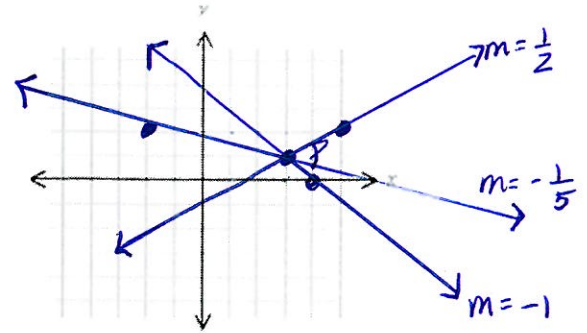
7. Sketch the graph of  $y=mx$  for the given values of  $m$ .

$m = 3, -2, 2/3, -1/4$



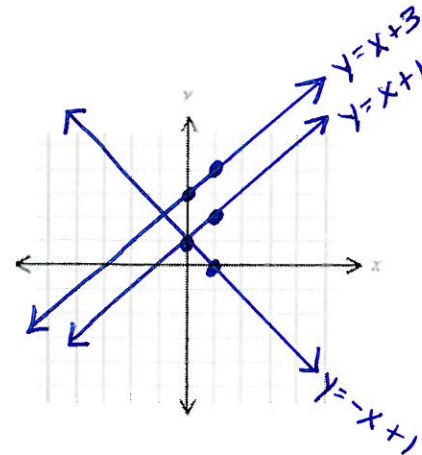
8. Sketch the graph of the line through P for each value of  $m$ .

$P(3, 1); m = 1/2, -1, -1/5$



9. Sketch the graphs of the lines on the same coordinate plane.

$y = x + 3, y = x + 1, y = -x + 1$



10. Find a general form of an equation of the line through the point A that satisfies the given condition.

$A(5, -2)$

(a) parallel to the y-axis

(b) perpendicular to the y-axis

$$x=5$$

$$y=-2$$

11.  $A(5, -3);$  slope  $-4$

12.  $A(4, 0);$  slope  $-3$

13.  $A(4, -5);$  through  $B(-3, 6)$

$$y = -4x + b$$

$$-3 = -4(5) + b$$

$$17 = b$$

$$y = -4x + 17$$

$$4x + y = 17$$

$$y = -3x + b$$

$$0 = -3(4) + b$$

$$12 = b$$

$$y = -3x + 12$$

$$3x + y = 12$$

$$m = \frac{6 - (-5)}{-3 - 4} = \frac{11}{-7}$$

$$y = -\frac{11}{7}x + b$$

$$-5 = -\frac{11}{7}(4) + b$$

$$\frac{9}{7} = b; y = -\frac{11}{7}x + \frac{9}{7}$$

$$\frac{11}{7}x + y = \frac{9}{7}; 11x + 7y = 9$$

14. A(2, -4); parallel to the line  $5x - 2y = 4$

$$m = -\frac{A}{B} = -\frac{-5}{-2} = \frac{5}{2}$$

$$y = \frac{5}{2}x + b$$

$$-4 = \frac{5}{2}(2) + b$$

$$-4 = 5 + b$$

$$-9 = b$$

$$y = \frac{5}{2}x - 9$$

$$-\frac{5}{2}x + y = -9$$

$$5x - 2y = 18$$

15. A(7, -3); perpendicular to the line  $2x - 5y = 8$

$$m = -\frac{A}{B} = -\frac{-2}{-5} = \frac{2}{5} \therefore m = -\frac{5}{2}$$

$$y = -\frac{5}{2}x + b$$

$$-3 = -\frac{5}{2}(7) + b$$

$$-\frac{29}{2} = b$$

$$y = -\frac{5}{2}x + \frac{29}{2}$$

$$\frac{5}{2}x + y = \frac{29}{2}$$

$$5x + 2y = 29$$

Find the slope-intercept form of the line that satisfies the given conditions.

16. x-intercept 4, y-intercept -3

$$y = mx + b$$

$$y = mx - 3$$

$$0 = m(4) - 3$$

$$\frac{3}{4} = m$$

$$y = \frac{3}{4}x - 3$$

17. through A(5,2) and B(-1, 4)

$$m = \frac{4-2}{-1-5} = \frac{2}{-6} = -\frac{1}{3}$$

$$y = -\frac{1}{3}x + b$$

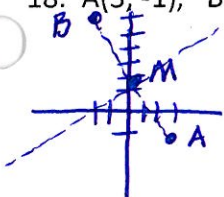
$$2 = -\frac{1}{3}(5) + b$$

$$\frac{11}{3} = b$$

$$y = -\frac{1}{3}x + \frac{11}{3}$$

Find a general form of an equation for the perpendicular bisector of the segment AB.

18. A(3, -1), B(-2, 6)



$$m_{AB} = -\frac{7}{5} \quad \text{Midpt} \left( \frac{3+(-2)}{2}, \frac{-1+6}{2} \right) = \left( \frac{1}{2}, \frac{5}{2} \right)$$

$$\text{so } \perp = \frac{5}{7}$$

$$y = \frac{5}{7}x + b$$

$$\frac{5}{2} = \frac{5}{7} \left( \frac{1}{2} \right) + b$$

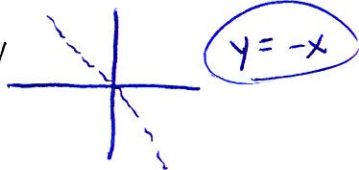
$$b = \frac{30}{14}$$

$$y = \frac{5}{7}x + \frac{30}{14}$$

$$y = \frac{5}{7}x + \frac{15}{7} \quad ; \quad 5x - 7y = -15$$

Find an equation for the line that bisects the given quadrants.

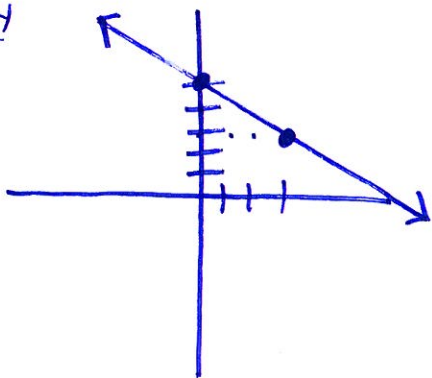
19. II and IV



Use the slope-intercept form to find the slope and y-intercept of the given line, and sketch its graph.

20.  $2x = 15 - 3y$

$$\frac{2x - 15}{-3} = \frac{-3y}{-3}$$



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

$$m = -\frac{2}{3}$$

$$b = 5$$

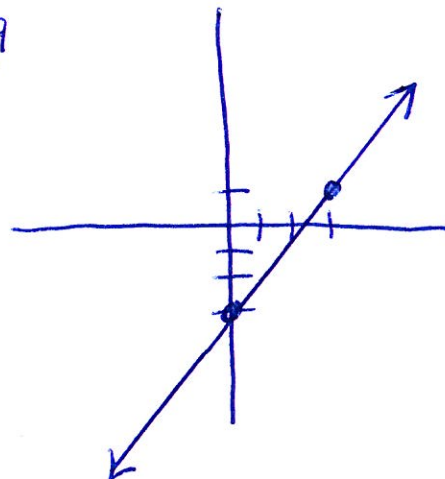
21.  $4x - 3y = 9$

$$\frac{-3y}{-3} = \frac{-4x + 9}{-3}$$

$$y = \frac{4}{3}x - 3$$

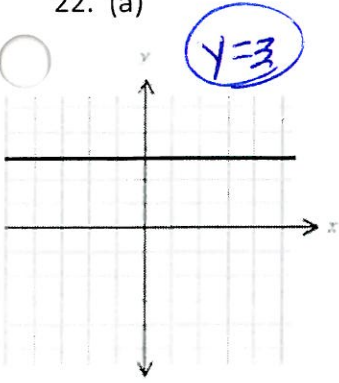
$$m = \frac{4}{3}$$

$$b = -3$$

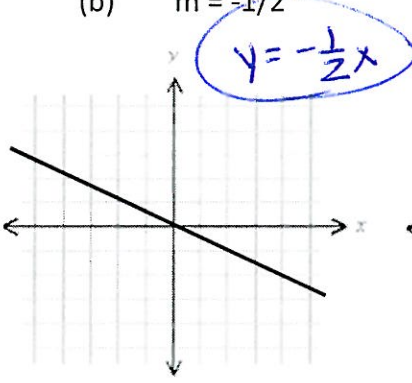


Find an equation of the line shown in the figure.

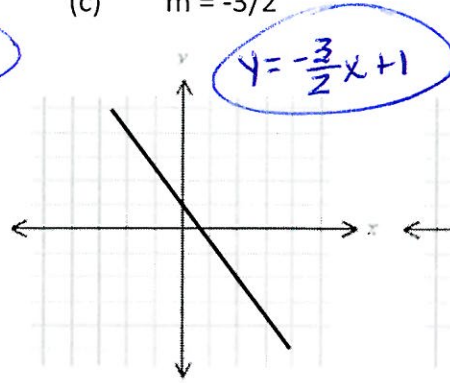
22. (a)



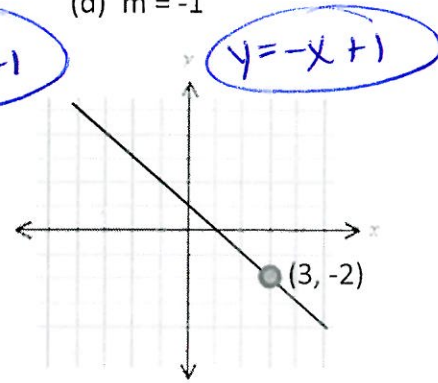
(b)  $m = -1/2$



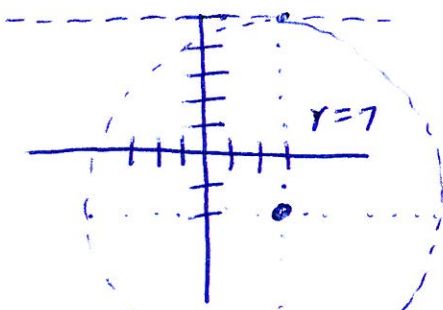
(c)  $m = -3/2$



(d)  $m = -1$



23. Find an equation of the circle that has its center  $C(3, -2)$  and is tangent to the line  $y = 5$ .



$$(x-3)^2 + (y+2)^2 = 49$$

24. Suppose a major league baseball player has hit 5 more home runs in the first 14 games, and he keeps up this pace throughout the 162-game season.

(a) Express the number of  $y$  home runs in terms of the number of  $x$  games played.  $y = mx$

$$(0, 0), (14, 5)$$

$$y = \frac{(\text{change in } y \text{ from beg. season})}{(\text{change in } x \text{ from beg. season})} x$$

(b) How many home runs will the player hit for the season?

$$y = \frac{5}{14}(162) \approx 58 \text{ homeruns}$$

$$y = \frac{(5-0)}{(14-0)} x ; y = \frac{5}{14} x$$

25. A baby weighs 10 pounds at birth, and three years later the child's weight is 30 pounds. Assume that childhood weight  $W$  (in pounds) is linearly related to age  $t$  (in years).

$$(0, 10), (3, 30)$$

(a) Express  $W$  in terms of  $t$ .

$$W = mt + b$$

$$W = \frac{20}{3}t + 10$$

$$m = \frac{30-10}{3-0} = \frac{20}{3}$$

(b) What is  $W$  on the child's sixth birthday?

$$W = \frac{20}{3}(6) + 10 ; W = 50 \text{ lb.}$$

(c) At what age will the child weigh 70 pounds?

$$70 = \frac{20}{3}t + 10 ; t = 9 \text{ years}$$

26. A college student receives an interest-free loan of \$8250 from a relative. The student will repay \$125 per month until the loan is paid off.

(a) Express the amount  $P$  (in dollars) remaining to be paid in terms of time  $t$  (in months).

$$P = mt + b$$

(b) After how many months will the student owe \$5000?

$$P = -125t + 8250$$

$$-125t + 8250 = 5000$$

$$t = 26 \text{ months}$$