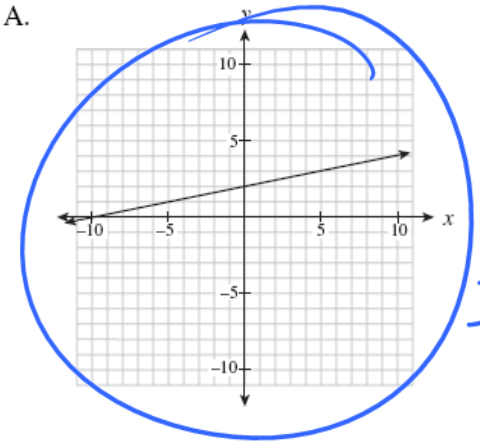
Linear Equations and Graphs Review

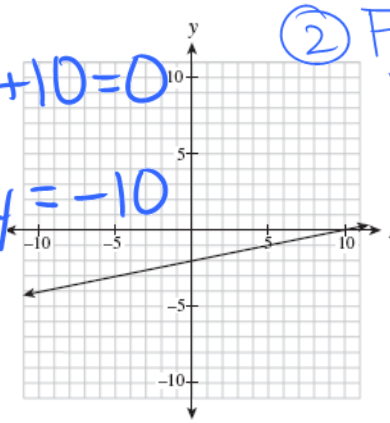
68. Which graph represents the relation $x - 5y + 10 = 0$?

NC

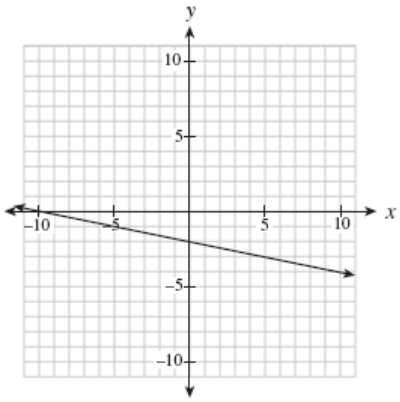
A.



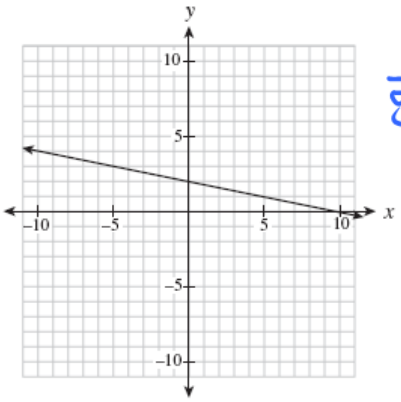
B.



C.



D.



① Find slope and a starting point

or

② Find x and y-intercepts.

$x - 5y + 10 = 0$

$x - 5y = -10$

x	y
-10	0
0	2

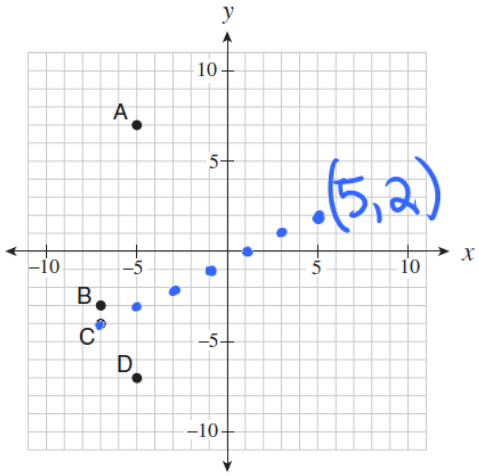
$x - 5y + 10 = 0$

$+5y \quad +5y$

$\frac{x + 10}{5} = \frac{5y}{5}$

$\frac{1}{5}x + 2 = y$

Use the following graph to answer question 69



69. NC The line $y-2=\frac{1}{2}(x-5)$ passes through which point on the graph?

A. A
B. B
C. C
D. D

slope

$x=5$

$y=2$

$y-k=\frac{1}{2}(x-h)$

$y-3$ means $y=3$

$y+3$ means $y=-3$

70. Determine the slope of the linear relation $3x+5y+15=0$.

A. $\frac{5}{3}$

B. $\frac{3}{5}$

C. $-\frac{3}{5}$

D. $-\frac{5}{3}$

① convert to $y=mx+b$

② graph intercepts and find $\frac{\text{rise}}{\text{run}}$

$3x+5y+15=0$

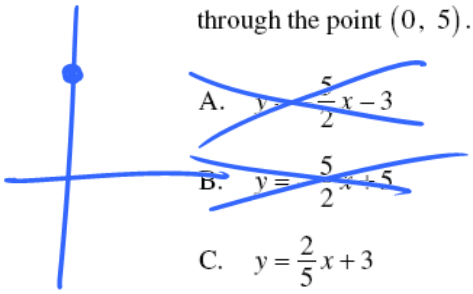
$-5y \quad -5y$

$3x+15=-5y$

$\frac{3x+15}{-5}=\frac{-5y}{-5}$

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

71. Determine the slope-intercept equation of the line that is parallel to $y=\frac{2}{5}x-3$ and passes through the point $(0,\ 5)$.



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

B. ~~$y=\frac{5}{2}x+5$~~

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

D. $y=\frac{2}{5}x+5$

$y=mx+b$

$y-5=\frac{2}{5}(x-0)$

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

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

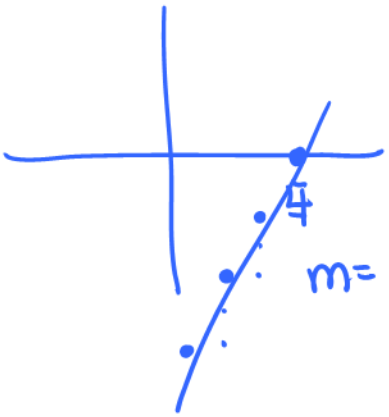
72. Lines A and B are perpendicular and have the same x-intercept. The equation of line A is $x+2y-4=0$. Determine the y-intercept of line B.

A. -8
B. -2
C. 4
D. 8

① Find x-intercept $\rightarrow (4,0)$

$x+2y=4$

x	y
0	2
4	0



$m=\frac{2}{1}$

$x+2y-4=0$

$-2y \quad -2y$

$\frac{x-4}{-2}=\frac{-2y}{-2}$

$y=2x-8$

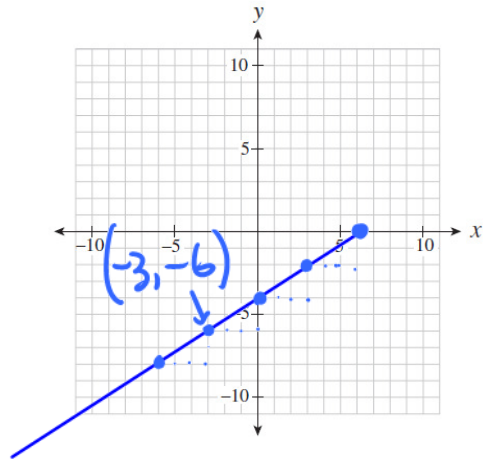
$m=\frac{2}{1}$

through $(4,0)$

$y-0=2(x-4)$

slope $\rightarrow -\frac{1}{2}x+2=y$

The grid below may be used for rough work to answer question 73



73. A line has a slope of $\frac{2}{3}$ and passes through the point $(6,\ 0)$. Which of the following points must also be on the line?

A. $(-3,\ -6)$
B. $(3,\ 8)$
C. $(4,\ -3)$
D. $(9,\ 3)$

74. Rewrite $y = \frac{x}{5} - 6$ in general form.

A. $\frac{x}{5} - y - 6 = 0$
B. $x + 5y - 6 = 0$
C. $x - 5y - 30 = 0$
D. $5x - 5y - 30 = 0$

$5(y) = 5\left(\frac{x}{5} - 6\right)$

$5y = x - 30$

$-5y \qquad -5y$

$0 = x - 5y - 30$

75. Given the equation $Ax + By + C = 0$, which of the following conditions must be true for the graph of the line to have a positive slope and a positive y-intercept?

A. $A > 0,\ B > 0,\ C > 0$
B. $A > 0,\ B < 0,\ C > 0$
C. $A > 0,\ B > 0,\ C < 0$
D. $A > 0,\ B < 0,\ C < 0$

$Ax + By + C = 0$

$-Ax \qquad -C \qquad -Ax - C$

$By = -Ax - C$

$y = -\frac{A}{B}x + \frac{-C}{B}$

slope $= -\frac{A}{B}$ y-int: $\frac{-C}{B}$

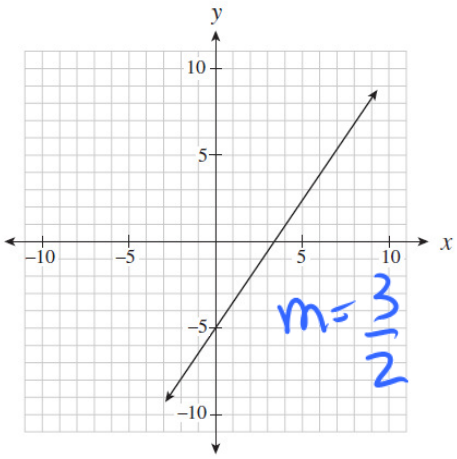
to have + slope, either A or B is negative

to have + y-intercept either C or B is negative

76. Which of the following graphs represents a line that passes through $(6, 4)$ and is perpendicular to $y = -\frac{2}{3}x$?

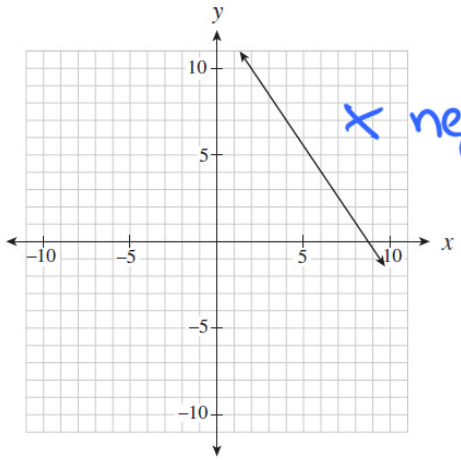
perpendicular slope = $\frac{3}{2}$

A.



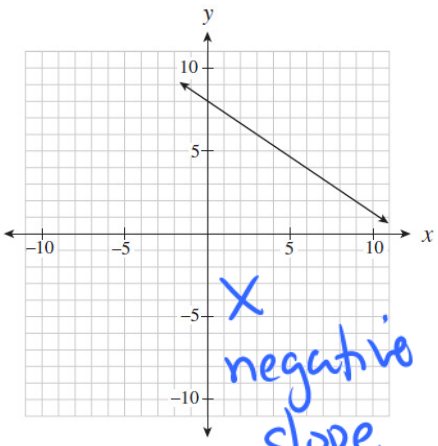
$m = \frac{3}{2}$

B.



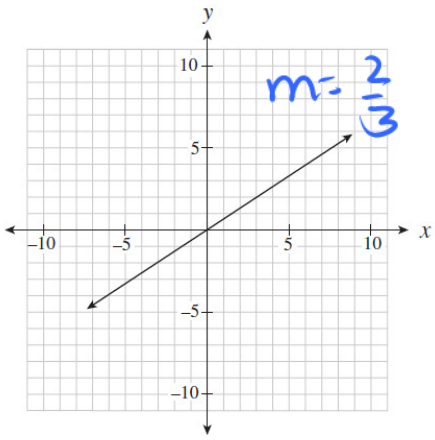
✗ negative slope

C.



✗ negative slope

D.



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

77. Determine the slope-intercept form of the line that passes through the point $(-4, 3)$ and is parallel to the line segment that joins $A(-1, -5)$ and $B(-3, 1)$.

slope is parallel to $\frac{1-(-5)}{-3-(-1)}$

A. $y = -3x - 9$
B. $y = -3x + 5$
C. $y = -3x + 15$
D. $y = 3x + 15$

$y - 3 = -3(x+4)$

$y - 3 = -3x - 12$

$+3 \quad +3$

$y = -3x - 9$

$= \frac{6}{-2}$

$= -3$

78. Which of the following statements are true for $2x + 3y = 6$?

I.	The y-intercept is -2.
II.	The line is parallel to $y = 2x$.
III.	The slope-intercept form of the line is $y = \frac{2}{3}x + 2$.
IV.	The range is all real numbers.

A. IV only
B. I and II only
C. I and IV only
D. III and IV only

x	y
0	2
3	0

$3y = -2x + 6$

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

79. A hot-dog stand owner makes a profit of $100 when he sells 90 hot dogs a day. He has a loss of $30 when he sells 25 hot dogs a day. Which linear relation represents his profit?

A. $y = 0.5x + 55$
B. $y = 1.08x + 3.08$
C. $y = 1.11x$
D. $y = 2x - 80$

Profit | (90, 100) (25, −30) | hot dogs.

$\text{slope} = \frac{100 - (-30)}{90 - 25} = \frac{130}{65} = 2$

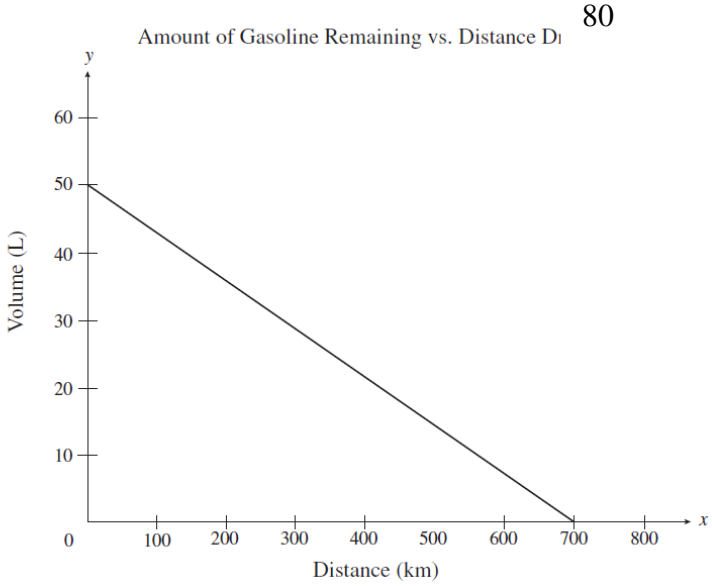
$y - 100 = 2(x - 90)$

$y - 100 = 2x - 180$

$+100 \quad +100$

$y = 2x - 80$

Use the following graph to answer question 80



80. The graph above shows the relationship between the amount of gasoline remaining in a 50 L tank and the distance driven for a certain car.

What does the x-intercept represent in this situation?

A. fuel capacity of the gasoline tank
B. total distance travelled during a long trip
C. total distance driven until the car is out of gas
D. number of kilometres driven per litre of gasoline

81. The slope of AB is $-\frac{2}{3}$. The slope of CD is $\frac{w}{24}$. Given AB $\parallel$ CD, determine the value of w.

Answer as an integer.

$24 \times -\frac{2}{3} = \frac{w}{24} \times 24 \qquad w = -16$

82. NC Determine the equation of a line, in slope-intercept form, that passes through the points $(6, 1)$ and $(-10, 9)$.

A. $y = -\frac{1}{2}x + 4$

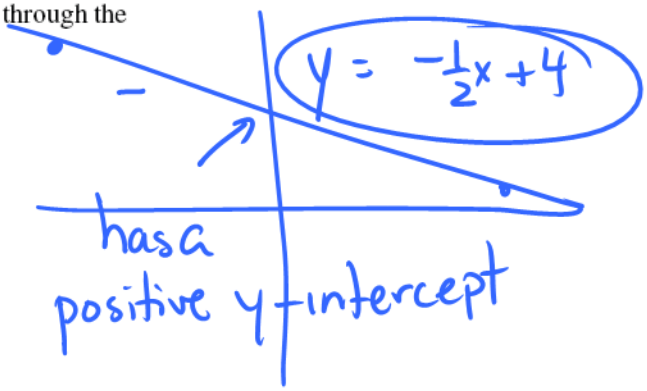
B. $y = -\frac{1}{2}x - 2$

C. $y = -2x + 8$

D. $y = -2x + 13$

$m = \frac{9-1}{-10-6} = \frac{8}{-16}$

$m = -\frac{1}{2}$



24 Which of the following lines have a negative slope?

83.

I.	$y + 3 = 0$
II.	$2x + y = 6$
III.	$(y + 2) = -4(x - 5)$

$y = -2x + 6$

A. II only
B. III only
C. I and III only
D. II and III only