

A # 23 p. 296-298 #3-5 [Write the equation and graph using 3 points.]
 #9-13, 20-22, 38-43, 47-48

Key

3. $(1, 1); m = 3$

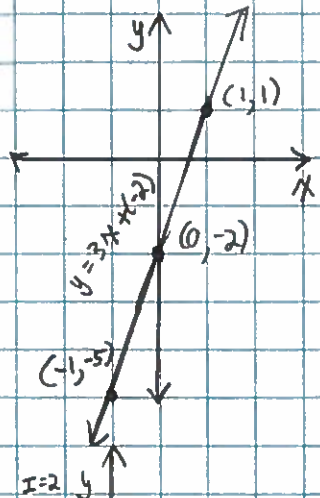
$$y = mx + b$$

$$1 = 3(1) + b$$

$$1 = 3 + b$$

$$b = -2$$

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



4. $(5, 1); m = 2$

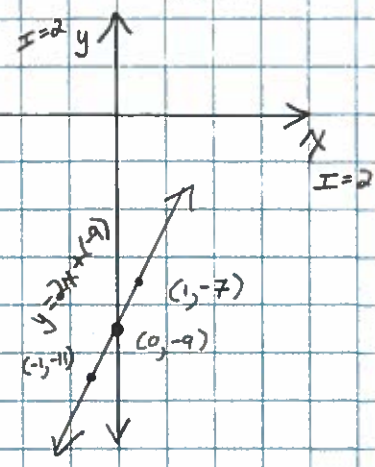
$$y = mx + b$$

$$1 = 2(5) + b$$

$$1 = 10 + b$$

$$b = -9$$

$$y = 2x + (-9)$$



5. $(-4, 7); m = -5$

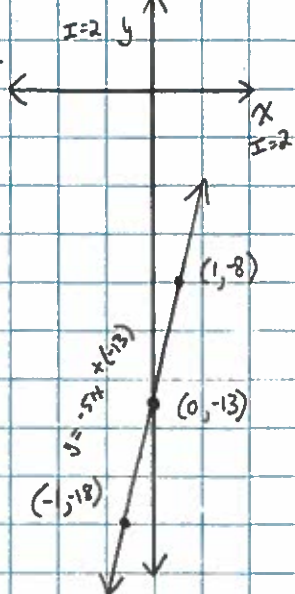
$$y = mx + b$$

$$7 = (-5)(-4) + b$$

$$7 = 20 + b$$

$$b = -13$$

$$y = -5x + (-13)$$



9. Error: Substituted x for y and y for x .

Correct: $(6, -3); m = -2$

$$y = mx + b$$

$$-3 = (-2)(6) + b$$

$$-3 = -12 + b$$

$$b = 9$$

$$y\text{-int: } (0, 9)$$

10. Error: Substituted 18 for "b" not for "m".

Correct: $m = 18$ per month

$$C = mx + b \quad (2, 81)$$

$$81 = 18(2) + b$$

$$81 = 36 + b$$

$$b = 45$$

The set-up fee is \$45.

11. $(1, 4) (2, 7)$

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

$$m = 3$$

$$y = mx + b$$

$$4 = 3(1) + b$$

$$4 = 3 + b$$

$$b = 1$$

$$y = 3x + 1$$

12. $(3, 2) (4, 9)$

$$m = \frac{\Delta y}{\Delta x} = \frac{9-2}{4-3} = \frac{7}{1}$$

$$m = 7$$

$$y = mx + b$$

$$2 = 7(3) + b$$

$$2 = 21 + b$$

$$b = -19$$

$$y = 7x + (-19)$$

13. $(10, -5) (-5, 1)$

$$m = \frac{\Delta y}{\Delta x} = \frac{-5-1}{10-(-5)} = \frac{-6}{15}$$

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

$$y = mx + b$$

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

$$1 = 2 + b$$

$$b = -1$$

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

20. $(-1, 3) (2, -\frac{1}{2})$

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

$$m = \frac{\frac{7}{2}}{-3} = \frac{7}{2}(-\frac{1}{3})$$

$$m = -\frac{7}{6}$$

$$y = mx + b$$

$$3 = -\frac{7}{6}(-1) + b$$

$$3 = \frac{7}{6} + b$$

$$b = \frac{11}{6}$$

$$y = -\frac{7}{6}x + \frac{11}{6}$$

A #23 continued

Key

p. 296-298 #21-22, 38-43, 47-48

21. $(-2, -2)$ $(1, -1)$

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

$$m = \frac{1}{3}$$

$$y = mx + b$$

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

$$-2 = -\frac{2}{3} + b$$

$$b = -\frac{4}{3}$$

$$y = \frac{1}{3}x + (-\frac{4}{3})$$

22. $(-3, 2)$ $(-2, -1)$

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

$$m = -3$$

$$y = mx + b$$

$$2 = -3(-3) + b$$

$$2 = 9 + b$$

$$b = -7$$

$$y = -3x + (-7)$$

38. $(-1, -2)$ $(3, 4)$

$$m = \frac{\Delta y}{\Delta x} = \frac{4 - (-2)}{3 - (-1)} = \frac{6}{4}$$

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

$$y = mx + b$$

$$4 = \frac{3}{2}(3) + b$$

$$\frac{8}{2} = \frac{9}{2} + b$$

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

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

39.

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

$$m = \frac{9}{2}$$

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

$$y = \frac{9}{2}x + (-\frac{1}{2})$$

40. $b = -\frac{1}{2} + 6$

$$b = 5\frac{1}{2} = \frac{11}{2}$$

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

$$y = \frac{3}{2}x + \frac{11}{2}$$

41. From # 38-40:

$y = \frac{3}{2}x + (-\frac{1}{2})$ and $y = \frac{9}{2}x + (-\frac{1}{2})$ intersect. [Different slopes]

$y = \frac{3}{2}x + \frac{11}{2}$ and $y = \frac{9}{2}x + (-\frac{1}{2})$ intersect. [Different slopes]

$y = \frac{3}{2}x + (-\frac{1}{2})$ and $y = \frac{3}{2}x + \frac{11}{2}$ do not intersect. [Same slope means they are parallel.]

42. Point A $(-4, -2)$

Point B $(2, 2.5)$

Point C $(8, 7)$

① Find the line containing Points A and B. ② Test Point C.

$$m = \frac{\Delta y}{\Delta x} = \frac{-2 - 2.5}{-4 - 2} = \frac{-4.5}{-6} = \frac{-9}{-12} = \frac{3}{4}$$

$$y = mx + b$$

$$-2 = \frac{3}{4}(-4) + b$$

$$-2 = -3 + b$$

$$b = 1$$

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

$$y = \frac{3}{4}x + 1 \quad (8, 7)$$

$$7 = \frac{3}{4}(8) + 1$$

$$7 = 6 + 1$$

$7 = 7$ ✓ Point C is a solution.

All 3 points are on the same line.

43. Point A $(2, 2)$

Point B $(-4, 5)$

Point C $(6, 1)$

① Find the line containing Points A and B. ② Test Point C.

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

$$y = mx + b$$

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

$$2 = -1 + b$$

$$b = 3$$

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

$$y = -\frac{1}{2}x + 3 \quad (6, 1)$$

$$1 = -\frac{1}{2}(6) + 3$$

$$1 = -3 + 3$$

$1 \neq 0$ Point C is not a solution.

All 3 points are not on the same line.

A #23 Continued
p. 298 #47-48

Key

47. $h = \#$ of feet (height of tree) $(4, 9)$ $(8, 12)$
 $n = \#$ of years
 (n, h)

$$\textcircled{1} m = \frac{\Delta h}{\Delta n} = \frac{12-9}{8-4} = \frac{3}{4}$$

The growth rate is $\frac{3}{4}$ feet per year.

$$\textcircled{2} y = mx + b$$

$$9 = \frac{3}{4}(4) + b$$

$$9 = 3 + b$$

$$b = 6$$

$$(0, 6)$$

The tree was
6 ft tall
when planted.

$h = \frac{3}{4}n + 6$ where h is the
height of the tree n years
after it was planted.

48. $A = \#$ of additional articles (after 25)
 $T = \#$ of \$ (Total cost)
 (A, T)

$(3, 34.80)$ $(5, 40.70)$

$$\textcircled{1} m = \frac{\Delta T}{\Delta A} = \frac{40.70 - 34.80}{5 - 3} = \frac{5.90}{2}$$

$m = \frac{\$}{2} 2.95$ per additional article

$$\textcircled{2} y = mx + b$$

$$34.80 = 2.95(3) + b$$

$$34.80 = 8.85 + b$$

$$b = \$25.95 \text{ [The cost of the]}$$

Subscription

$T = 2.95A + 25.95$ where T is the
total cost of a subscription after viewing
 A additional articles.