A #24 p. 296 – 299 # 6 – 8 (Equation and Graph), 14–19, 50–52

Key

6. $(5, -5)$; $m = -2$

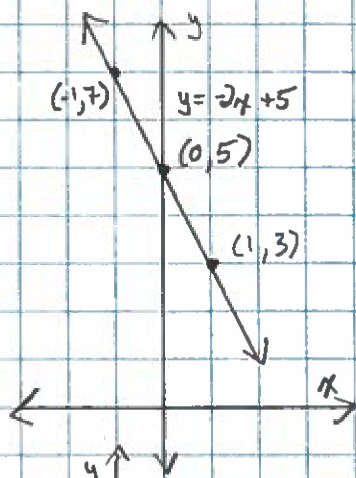
$y = mx + b$

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

$-5 = -10 + b$

$b = 5$

$\boxed{y = -2x + 5}$



7. $(8, -4)$; $m = -\frac{3}{4}$

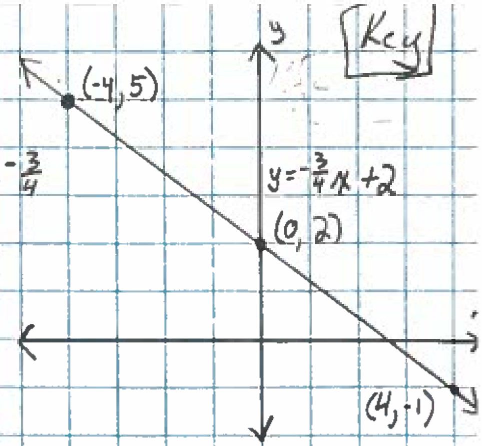
$y = mx + b$

$-4 = -\frac{3}{4}(8) + b$

$-4 = -6 + b$

$b = 2$

$\boxed{y = -\frac{3}{4}x + 2}$



8. $(-3, -11)$; $m = \frac{1}{2}$

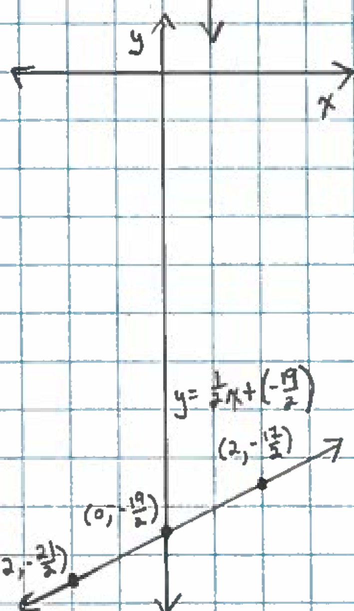
$y = mx + b$

$-11 = \frac{1}{2}(-3) + b$

$-\frac{22}{2} = -\frac{3}{2} + b$

$b = -\frac{19}{2}$

$y = \frac{1}{2}x + \left(-\frac{19}{2}\right)$



14. $(-2, 8)$ $(-6, 0)$

① $m = \frac{\Delta y}{\Delta x} = \frac{8-0}{-2-(-6)}$

$m = \frac{8}{4} = 2$

② $y = mx + b$

$8 = 2(-2) + b$

$8 = -4 + b$

$b = 12$

$\boxed{y = 2x + 12}$

15. $\left(\frac{9}{2}, 1\right)$ $\left(-\frac{7}{2}, 7\right)$

① $m = \frac{\Delta y}{\Delta x} = \frac{1-7}{\frac{9}{2}-\left(-\frac{7}{2}\right)} = \frac{-6}{8}$

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

② $y = mx + b$

$1 = -\frac{3}{4}\left(\frac{9}{2}\right) + b$

$\frac{8}{8} = -\frac{27}{8} + b$

$b = \frac{35}{8}$

$\boxed{y = -\frac{3}{4}x + \frac{35}{8}}$

16. $\left(-5, \frac{3}{4}\right)$ $\left(-2, -\frac{3}{4}\right)$

① $m = \frac{\Delta y}{\Delta x} = \frac{\frac{3}{4}-\left(-\frac{3}{4}\right)}{-5-(-2)}$

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

② $y = mx + b$

$\frac{3}{4} = -\frac{1}{2}(-5) + b$

$\frac{3}{4} = \frac{10}{4} + b$

$b = -\frac{7}{4}$

$\boxed{y = -\frac{1}{2}x + \left(-\frac{7}{4}\right)}$

17. From Graph:

① $m = \frac{\Delta y}{\Delta x} = \frac{4}{1} = 4$

$(4, 1)$ $(3, -3)$

② $y = mx + b$

$1 = 4(4) + b$

$1 = 16 + b$

$b = -15$

$\boxed{y = 4x + (-15)}$

18. From Graph:

① $m = \frac{\Delta y}{\Delta x} = \frac{2}{5}$

$(-2, 0)$ $(3, 2)$

② $y = mx + b$

$0 = \frac{2}{5}(-2) + b$

$0 = -\frac{4}{5} + b$

$b = \frac{4}{5}$

$\boxed{y = \frac{2}{5}x + \frac{4}{5}}$

19. From Graph:

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

$(-3, 2)$ $(1, 0)$

② $y = mx + b$

$0 = -\frac{1}{2}(1) + b$

$0 = -\frac{1}{2} + b$

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

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

A #24 continued
p. 298 #50-52

Key

50. ① C = # of \$ (Annual Cost of telephone service)
n = # of years (after 1981) (n, C)

②
$m = \frac{\Delta C}{\Delta n}$ = \$27.80 per year $(20, 914)$

$y = mx + b$
$914 = 27.80(20) + b$
$914 = 556 + b$
b = \$358 (Cost in 1981) — Answer to part a.

③ $C = 27.8n + 358$ where C is the annual cost of telephone service n years after 1981. — Answer to Part b.

Part c: 2000 → $n = 19$
$C = 27.8n + 358$
$C = 27.8(19) + 358$
$C = 528.20 + 358$
C = \$886.2

The annual cost of telepone service in 2000 would have been about \$886.20.

51. ① P = # of Sunday newspapers
n = # of years (after 1970) (n, P)

② $m = \frac{\Delta P}{\Delta n}$ = 11.8 newspapers per year $(27, 903)$

$y = mx + b$
$903 = 11.8(27) + b$
$903 = 318.6 + b$
$b = 584.4$ [Approximate # of Sunday Papers in 1970] — Answer to Part a

③ $P = 11.8n + 584.4$ where P is the # of Sunday newspapers in circulation n years after 1970. — Answer to Part b.

Part C: 2000 → $n = 30$
$P = 11.8n + 584.4$
$P = 11.8(30) + 584.4$
$P = 354 + 584.4$
$P = 938.4$ Sunday newspapers

I would expect that there about 938 Sunday newspapers in circulation in 2000.

52. ① A = # of airports
n = # of years (after 1990) (n, A)

② $m = \frac{\Delta A}{\Delta n}$ = 175 airports per year $(11, 19{,}306)$

$y = mx + b$
$19{,}306 = 175(11) + b$
$19{,}306 = 1925 + b$
$b = 17{,}381$ (airports in 1990) — Answer to Part a

③ $A = 175n + 17{,}381$ where A is the number of airports in the U.S. n years after 1990. — Answer to Part b

Part C: $A = 19{,}200$
$A = 175n + 17{,}381$
$19{,}200 = 175n + 17{,}381$
$175n = 1819$
$n \approx 10.4$ years after 1990

The number of airports reached 19,200 in the year 2000.