PART A

1) A line has a slope of 2 and passes through the point $(3,16)$.
   a) Use the given point and slope to sketch a graph of the line.
   b) Use your graph to identify the line's y-intercept.
   c) Using the slope and y-intercept, write the equation of the line in $y = mx + b$ form.

2) A line has a slope of $-\frac{4}{3}$ and passes through the point $(-3,-2)$.
   a) Use the given point and slope to sketch a graph of the line.
   b) Use your graph to identify the line's y-intercept.
   c) Using the slope and y-intercept, write the equation of the line in $y = mx + b$ form.

3) A line has a slope of 3 and passes through the point $(5,27)$.
   a) Write the equation $y = mx + b$ with the given slope substituted for m.
   b) Rewrite your equation from part (a) with the coordinates of the given point substituted for x and y.
   c) Solve your equation from part (b) to determine the line's y-intercept, b.
   d) Write the equation of the line.

4) A line has a slope of $\frac{5}{6}$ and passes through the point $(-12,-14)$.
   a) Write the equation $y = mx + b$ with the given slope substituted for m.
   b) Rewrite your equation from part (a) with the coordinates of the given point substituted for x and y.
   c) Solve your equation from part (b) to determine the line's y-intercept, b.
   d) Write the equation of the line.

5) Identify each of the following lines as either horizontal or vertical.

   a) $y = 8$ b) $y = -9$ c) $x = 10$ d) $y = \frac{7}{2}$ e) $x = -50$

6) Sketch a graph of each line.

   a) $y = 4$ b) $x = 4$ c) $y = -3.5$ d) $x = -9$

PART B

7) Find the equation of the line that has the given slope and passes through the given point.

   a) **Slope:** 1 **Point:** $(15,31)$
   b) **Slope:** -9 **Point:** $(5,-17)$
   c) **Slope:** 6 **Point:** $(-4,-42)$
   d) **Slope:** 0 **Point:** $(52,-63)$

8) Find the equation of the line that has the given slope and passes through the given point.

a) **Slope:** $\frac{1}{2}$ **Point:** $(30,23)$

b) **Slope:** $-\frac{4}{3}$ **Point:** $(-15,0)$

c) **Slope:** $-\frac{5}{6}$ **Point:** $(6,80)$

d) **Slope:** $\frac{3}{4}$ **Point:** $(-48,-61)$

9) The relationship between an employee's annual salary and the number of years of experience is linear. For each additional year of experience, the annual salary increases by \$4000. An employee with 8 years of experience earns an annual salary of \$71 000.

a) Determine the annual salary of an employee with no experience.
b) Create an equation to relate annual salary (S) to years of experience (n).
c) Determine the annual salary of an employee with 12 years of experience.

10) Once his parachute is open, a skydiver descends at a rate of 25 feet per second. 90 seconds after the parachute opens, his altitude is 2750 feet.

a) Determine an equation to model the skydiver's altitude (A) after his parachute has been open for t seconds.
b) Use your equation to determine the skydiver's altitude after the parachute has been open for 2 minutes.
c) Once the parachute is open, how long does the skydiver take to reach the ground?

11) A horizontal line passes through the point $(45,30)$. Determine the equation of the line.

12) The slope of a line that passes through $(-8,6)$ is undefined. Write the equation of the line.

13) Write the equation of the y-axis.

14) A line with a slope of $\frac{5}{9}$ passes through the origin. Determine the equation of the line.

PART C

15) Determine the equation of the line that has a slope of $\frac{3}{2}$ and passes through the point $\left(\frac{3}{4},\frac{7}{24}\right)$.

16) Determine the equation of the line that is parallel to the line $y=16$ and passes through $(5,4)$.

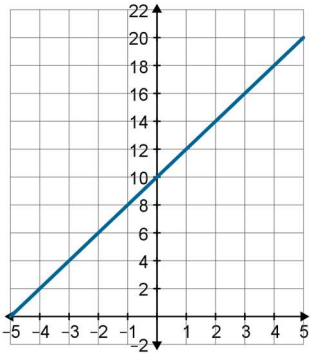
17) Determine the equation of the line that is perpendicular to $x=-9$ and passes through $(40,-85)$.

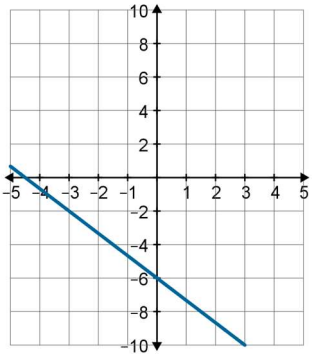
18) Determine the equation of the line that is parallel to $y=-\frac{4}{7}x-\frac{55}{2}$ and passes through $\left(\frac{91}{2},\frac{41}{2}\right)$.

19) Find the equation of the line that passes through the point $(18,-7)$ and has a y-intercept of 5.

20) Determine the equation of the line that passes through the points $(3,-12)$ and $(-6,-27)$.

ANSWERS

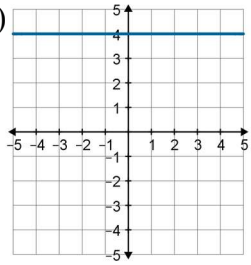
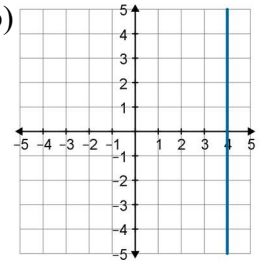
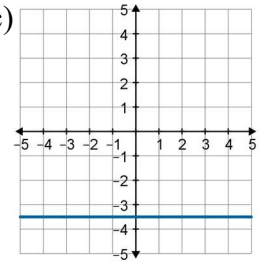
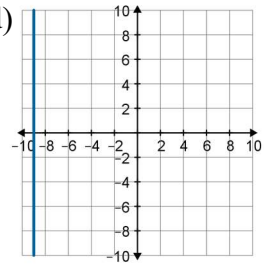
1) a)  b) 10 c) $y = 2x + 10$

2) a)  b) -6 c) $y = -\frac{4}{3}x - 6$

3) a) $y = 3x + b$ b) $27 = 3(5) + b$ c) 12 d) $y = 3x + 12$

4) a) $y = \frac{5}{6}x + b$ b) $-14 = \frac{5}{6}(-12) + b$ c) -4 d) $y = \frac{5}{6}x - 4$

5) a) horizontal b) horizontal c) vertical d) horizontal e) vertical

6) a)  b)  c)  d) 

7) a) $y = x + 16$ b) $y = -9x + 28$ c) $y = 6x - 18$ d) $y = -63$

8) a) $y = \frac{1}{2}x + 8$ b) $y = -\frac{4}{3}x - 20$ c) $y = -\frac{5}{6}x + 85$ d) $y = \frac{3}{4}x - 25$

9) a) \$39 000 b) $S = 4000n + 39000$ c) \$87 000

10) a) $A = -25t + 5000$ b) 2000 feet c) 200 seconds

11) $y = 30$ **12)** $x = -8$ **13)** $x = 0$ **14)** $y = \frac{5}{9}x$

15) $y = \frac{3}{2}x - \frac{5}{6}$ **16)** $y = 4$ **17)** $y = -85$

18) $y = -\frac{4}{7}x + \frac{93}{2}$

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

20) $y = \frac{5}{3}x - 17$