

4.6 EQUATIONS OF LINES USING SLOPE AND A POINT

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) 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) $x = -50$
- 5) 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)



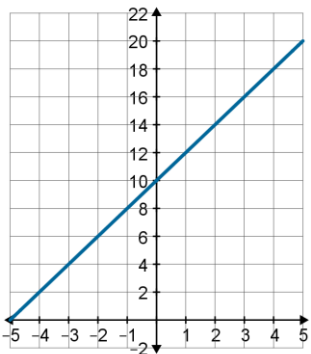
PART B

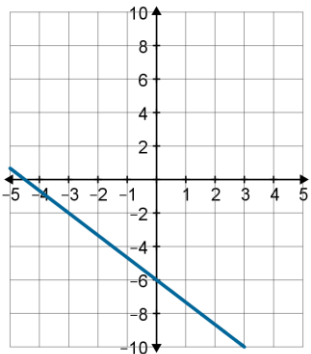
- 6) Find the equation of the line that has the given slope and passes through the given point.
 - a) **Slope:** $\frac{1}{2}$
Point: (30,23)
 - b) **Slope:** $-\frac{4}{3}$
Point: (-15,0)
 - c) **Slope:** $-\frac{5}{6}$
Point: (6,80)
 - d) **Slope:** $\frac{3}{4}$
Point: (-48,-61)
- 7) The relationship 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.
- 8) Find the equation of a line parallel to $y = 2x + 8$ and passes through the point (-3,4)
- 9) A horizontal line passes through the point (45,30). Determine the equation of the line.
- 10) The slope of a line that passes through (-8,6) is undefined. Write the equation of the line.
- 11) Determine the equation of a line perpendicular to $y = \frac{1}{3}x - 5$ and passes through the point (1,-4).



- 12) Write the equation of the line with the same x-intercept as $2x+y=8$ and slope of 4.
- 13) Determine the equation of the line that has a slope of $\frac{3}{2}$ and passes through the point $\left(\frac{3}{4}, \frac{7}{24}\right)$.
- 14) Determine the equation of the line that is perpendicular to $x=-9$ and passes through $(40, -85)$.
- 15) Find the equation of the line that passes through the point $(18, -7)$ and has a y-intercept of 5.

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) horizontal b) horizontal c) vertical d) horizontal e) vertical

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

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

- 7) a) \$39 000 b) $S=4000n+39000$ c) \$87 000 8) $y=2x+10$

- 9) $y=30$ 10) $x=-8$ 11) $y=-3x-1$ 12) $y=4x-16$

- 13) $y=\frac{3}{2}x-\frac{5}{6}$ 14) $y=-85$

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