

Chapter 5 Study Guide

For Questions 1 and 2, find the slope of the line passing through each pair of points. If the slope is undefined, write "undefined."

1. $(-8, 7)$ and $(5, -2)$

1. $-\frac{9}{13}$

2. $(5, 9)$ and $(5, -3)$

2. $\frac{12}{0} = \text{undefined}$

3. Find the value of r so that the line through $(-4, 3)$ and $(r, -3)$ has a slope of $\frac{2}{3}$.

3. $r = -13$

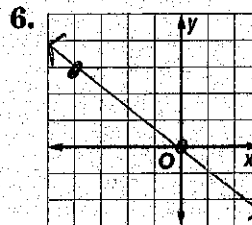
4. Find the value of r so that the line through $(r, 5)$ and $(6, r)$ has a slope of $\frac{5}{8}$.

4. $r = \frac{70}{13}$

5. In 1990, there were approximately 35,000 people in Lancaster. Five years later, the population was 38,452. Find the rate of change in the population.

5. $\approx 690 \text{ people/year}$

6. Graph $y = -\frac{3}{4}x$.



7. If an ostrich can run 15 kilometers in 15 minutes, how many kilometers can it run in an hour?

7. 60 km

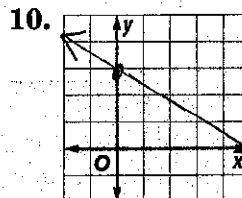
8. Write the point-slope form of an equation of the line that has slope $-\frac{3}{5}$ and passes through $(2, 1)$.

8. $y - 1 = -\frac{3}{5}(x - 2)$

9. Write an equation in standard form of the line that passes through $(2, -3)$ and $(-3, 7)$.

9. $2x + y = 1$

10. Graph a line whose x -intercept is 5 and whose slope is $-\frac{3}{5}$.



11. Write $y + 4 = -\frac{2}{3}(x - 9)$ in standard form.

11. $2x + 3y = 6$

12. Write the point-slope form of the equation for the line that has x -intercept -3 and y -intercept -2 .

12. $y + 2 = -\frac{2}{3}(x - 0)$
 $y + 0 = -\frac{2}{3}(x + 3)$

Assessment

Chapter 5 Study Guide

For Questions 13–20, write an equation in slope-intercept form of the line satisfying the given conditions.

13. has y -intercept -8 and slope 3

13. $y = 3x - 8$

14. has slope $\frac{5}{2}$ and passes through $(4, -1)$

14. $y = \frac{5}{2}x - 11$

15. passes through $(-3, 7)$ and $(2, 4)$

15. $y = -\frac{3}{5}x + \frac{26}{5}$

16. is horizontal and passes through $(-4, 6)$

16. $y = 6$

17. is parallel to the y -axis and has an x -intercept of 3

17. $x = 3$

18. is perpendicular to $4y = 3x - 8$ and passes through $(-12, 7)$

18. $y = -\frac{4}{3}x - 9$

19. is parallel to $3x - 5y = 7$ and passes through $(0, -6)$

19. $y = \frac{3}{5}x - 6$

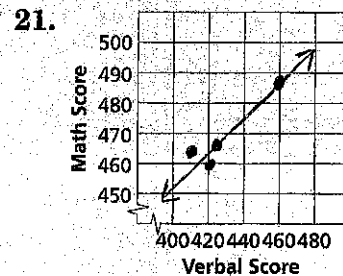
20. is perpendicular to the y -axis and passes through $(-2, 5)$

20. $y = 5$

For Questions 21–23, use the data in the table.

21. Make a scatter plot relating the verbal scores and the math scores.

State Graduation Scores		
Year	Verbal Score	Math Score
1970	460	488
1980	424	466
1990	410	463
2000	420	460



22. Does the scatter plot in Question 21 show a *positive*, a *negative*, or *no correlation*? What does that relationship represent?

22. positive as the verbal score goes up, the math score also goes up

23. Write the equation for a line of fit. Predict the corresponding math score for a verbal score of 445.

23. $y = 0.61x + 207.36$
The math score would be about 479

24. A rental car company charges \$52.99 per day, including 200 free kilometers. There is a charge of \$0.12/km for additional kilometers. Write a linear equation that models this situation.

24. $y = 0.12(x - 200) + 52.99$
or
 $y = 0.12x + 20.99$

25. Write the slope-intercept form of $y + 3 = -0.5(x - 10)$.

25. $y = -0.5x + 2$

Bonus The area of a circle varies directly as the square of the radius. If the radius is tripled, by what factor will the area increase?

B: $\times 9$

$$\textcircled{1} \quad m = \frac{\Delta y}{\Delta x} = \frac{7 - (-2)}{-8 - 5} = \frac{9}{-13}$$

$$\textcircled{2} \quad m = \frac{\Delta y}{\Delta x} = \frac{9 - (-3)}{5 - 5} = \frac{12}{0} = \text{undefined}$$

blc zero is
in denom.

$$\textcircled{3} \quad \frac{2}{3} = \frac{3 - (-3)}{-4 - r} \Rightarrow \frac{2}{3} = \frac{6}{-4 - r}$$

$$\begin{array}{r} \times 3 \\ \hline 2 = \frac{6}{-4 - r} \\ \hline \times 3 \\ \hline 6 = -4 - r \\ +4 \quad +4 \\ \hline -1(6) = (-r) - 1 \\ -6 = -r \\ -13 = r \end{array}$$

$$\textcircled{4} \quad \frac{5}{8} = \frac{(r-5)}{(6-r)}$$

$$\begin{aligned} 8(r-5) &= 5(6-r) \\ 8r - 40 &= 30 - 5r \\ +40 \quad +40 \end{aligned}$$

$$\begin{aligned} 8r &= 70 - 5r \\ +5r \quad +5r \end{aligned}$$

$$\frac{13r}{13} = \frac{70}{13}$$

$$r = \frac{70}{13}$$

$$\textcircled{5} \quad \frac{\Delta y}{\Delta x} = \frac{\Delta \text{population}}{\Delta \text{years}} = \frac{38452 - 35000}{5} = \frac{3452}{5} = 690.4 \approx 690 \text{ people/year}$$

⑥ (see test paper)

$$\textcircled{7} \quad \frac{15 \text{ km}}{15 \text{ min}} = \frac{?}{60 \text{ min}}$$

$$\frac{900}{15} = 60 \text{ km}$$

⑧ (see test paper)

$$\textcircled{9} \quad m = \frac{7 - (-3)}{-3 - 2} = \frac{10}{-5} = -2$$

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

$$\begin{array}{r} y + 3 = -2x + 4 \\ -3 \quad \quad -3 \end{array}$$

$$\begin{array}{r} y = -2x + 1 \\ +2x \quad +2x \end{array}$$

$$2x + y = 1$$

⑩ (see test paper)

$$\textcircled{11} \quad y + 4 = -\frac{2}{3}(x - 9)$$

$$\begin{array}{r} y + 4 = -\frac{2}{3}x + 6 \\ -4 \quad \quad -4 \end{array}$$

$$\begin{array}{r} y = -\frac{2}{3}x + 2 \\ +\frac{2}{3}x \quad +\frac{2}{3}x \end{array}$$

$$3\left(\frac{2}{3}x + y\right) = (2)3$$

$$2x + 3y = 6$$

⑫ $(-3, 0) (0, -2)$
 $m = \frac{0 - (-2)}{-3 - 0} = \frac{2}{-3}$

⑬ (see test)

⑭ $y + 1 = \frac{5}{2}(x - 4)$
 $y + 1 = \frac{5}{2}x - 10$
 $-1 \quad -1$
 $y = \frac{5}{2}x - 11$

⑮ $m = \frac{7 - 4}{-3 - 2} = \frac{3}{-5}$

$y - 4 = \frac{-3}{5}(x - 2)$
 $y - 4 = \frac{-3}{5}x + \frac{6}{5}$
 $+\frac{20}{5} \quad +\frac{20}{5}$
 $y = \frac{-3}{5}x + \frac{26}{5}$

⑯ horizontal is \longleftrightarrow
 $y = 6$
 just goes through the
 y -axis

⑰ \parallel to y -axis, so it is
 vertical \updownarrow
 so $x = 3$

⑱ $\frac{4y}{4} = \frac{3x - 8}{4}$
 $y = \frac{3}{4}x - 2$
 $m = \frac{3}{4}$
 $\perp m = \frac{-4}{3}$

$y - 7 = \frac{-4}{3}(x + 12)$
 $y - 7 = \frac{-4}{3}x - 16$
 $+7 \quad +7$
 $y = \frac{-4}{3}x - 9$

⑲ $3x - 5y = 7$
 $-3x \quad -3x$
 $-5y = -3x + 7$
 $\frac{-5y}{-5} = \frac{-3x + 7}{-5}$
 $m = \frac{3}{5}$

$(0, -6)$ is the y -intercept,
 so $y = \frac{3}{5}x - 6$

⑳ \perp to y -axis, so
 it must be
 horizontal \longleftrightarrow
 $y = 5$

㉑ (see test paper)
 ㉒ (see test)

$$\textcircled{23} \quad (460, 488) \quad (424, 466)$$

$$\frac{488 - 466}{460 - 424} = \frac{22}{36} = 0.6\bar{1} \approx 0.61$$

$$y - 466 = 0.61(x - 424)$$

$$y - 466 = 0.61x - 258.64$$

$$+466 \qquad \qquad +466$$

$$y = 0.61x + 207.36$$

$$y = 0.61(445) + 207.36$$

$$y = 478.81$$

$$y \approx 479$$

*your eqn. could be different if you used different points. BUT it should be close to mine!

$$\textcircled{24} \quad y = \text{cost}$$

$$x = \text{kilometers driven } \underline{\text{total}}$$

$$y = 52.99 + 0.12(x - 200)$$

$$y = 52.99 + 0.12x - 24$$

$$y = 0.12x + 28.99$$

$$\textcircled{25} \quad y + 3 = -0.5(x - 10)$$

$$y + 3 = -0.5x + 5$$

$$\begin{array}{r} -3 \qquad \qquad -3 \end{array}$$

$$y = -0.5x + 2$$

Bonus

$$y = kx$$

area of 0 \swarrow \searrow r^2

$$A = kr^2$$

use $r=2$
 $\times 3$

$$A = k(2)^2$$

$$A = k \cdot 4 = 4k$$

use $r=6$

$$A = k(6)^2$$

$$A = k \cdot 36 = 36k$$

9x bigger