CHAPTER 4 Test REVIEW

Write an equation of the line in slope-intercept form, standard form (with integer values and a positive leading coefficient), and in Point-Slope form.

1. slope: -8; y- intercept: 0
2. Slope: ¼; y-intercept: -3
3. (-2, 8), (7, -5.5)
4. (-5, -13.5), (2.5, 5.25)

Write an equation for the linear function f with the given values.

5. $f(6) = 2,\ f(15) = -4$
6. $f(-9) = -14,\ f(12) = 14$

7. Swimming For exercise, you swim several times a week. Currently, you swim 5 laps each time you swim. You want to gradually increase the number of laps each time you swim. Your plan is to swim 2 additional laps each time you swim. Write an equation that gives the total number of laps you swim as a function of the number of times you have been swimming since you started adding laps. Find the total number of laps you will swim in 8 weeks if you swim 3 times a week.

8. A line passes through the points (3, 16), (-2, -14), and (*h*, 28). Find the value of *h*.
Explain your steps.

9. **Car Wash** You are scheduled to start your job at a car wash 2 hours after the car wash opens. Three hours after you start, a total of 47 cars have been washed since the car wash opened. Three hours later, a total of 55 cars have been washed. At what rate are the cars being washed? How many cars were washed before you started work?

Write an equation of the line in slope-intercept form. Then write the equation of a line that is parallel and passes through the point (4,-8). Finally, write an equation for the line that is perpendicular and passes through the point (4,-8).

10. (9, -3); m = 2/3
11. (-4, -6); m = 5/2
12. (-8, 5), m = -3/4
13. (5, -1), (9, -3)

Find the missing coefficient in the equation of the line that passes through the given point.

14. $Ax + 4y = 2$, (3, 21)
15. $-5x + By = -1$, (-4, 7)

Write an equation of the line that passes through the given point and is parallel to the given line.

16. (-1, 4), 8x + 2y = 11
17. (-3, 11), 6x -5y =1

Write an equation of the line that passes through the given point and is perpendicular to the given line.

18. (17, -3), 9x – 6y = 4
19. (2, -15), 6y – 5x = 2

Determine which of the following lines, if any, are parallel or perpendicular.

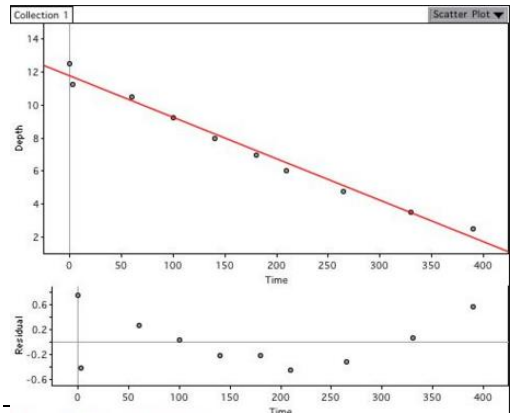
20. Line *a*: $4x - 3y = 2$, Line *b*: $3x + 8 + 4y = 0$, Line *c*: $y - 6 = 3/4\ (x - 1)$

Compare to the parent function. Does the function open up or down? Determine if there is a maximum or a minimum value and find the value. Identify the vertex, the axis of symmetry.

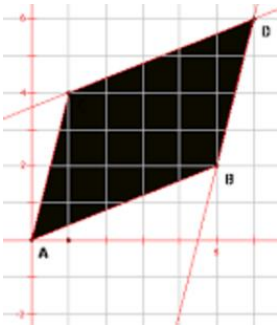
21. $g(x) = -\frac{5}{3}|x - 2| + 7$
22. $h(x) = 8|x| - 3$
23. $g(x) = \frac{1}{5}|x + 1|$

Determine which of the following lines, if any, are parallel or perpendicular.

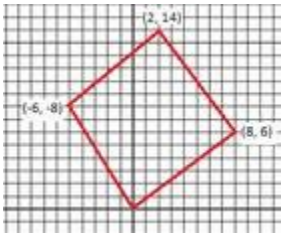
24. Line a: $y = \frac{2}{3}x - 4$
    Line b: 2y – 3x = 5
    Line c: 6x – 3y = 10
25. Line a = 4x – 3y = 2
    Line b: 3x + 8 + 4y = 0
    Line c: $y - 6 = \frac{3}{4}(x - 1)$
26. The graph of a linear function *f(x)* is parallel to the line described by 2x + y = 5 and contains the point (6,-2). What is the y-intercept of *f(x)*?
27. The line of best fit shown is represented by the equation $y = -\frac{11}{480}x + \frac{25}{2}$



a. Does the residual plot appear to represent an appropriate fit of the data?
b. The scatter plot includes the point (100,9.5). Find the residual for the point x=100
28. Write a direct variation equation for the line that goes through the point (-5, 2/3).
29. Prove that the image is a parallelogram. Justify your answer using slopes.



30. Determine if the figure is a square or a rhombus. Justify your answer using slopes



Answers:

1. Slope intercept form $y = -8x$; **Standard form** $8x + y = 0$; **Find a point for Point-Slope**
2. **Slope intercept form** $y = \frac{1}{4}x - 3$; $Standard\ form\ x - 4y = 12$ **Find a point to use for Point-Slope**
3. $y = -1.5x + 5$; $3x + 2y = 10$; $y - 8 = -1.5(x + 2)$
4. $y = 2.5x - 1$; $5x - 2y = 2$; $y + 13.5 = 2.5(x + 5)$
5. $f(x) = -\frac{2}{3}x + 6$;
6. $f(x) = \frac{4}{3}x - 2$
7. $y = 2x + 5$; 53 laps
8. **Sample Answer:**
   First find the equation of the line passing through (3,16) and (-2,-14). The line is given by y=6x-2. Find the value of h by substituting 28 for y and solving for x. h=5.
9. **About 2.7 cars per hour; 39 cars**
10. $y = \frac{2}{3}x - 9$; **parallel:** $y = \frac{2}{3}x - \frac{32}{3}$ **perpendicular:** $y = -\frac{3}{2}x - 2$
11. $y = \frac{5}{2}x + 4$; **parallel**: $y = \frac{5}{2}x - 18$; **perpendicular:** $y = -\frac{2}{5}x - \frac{32}{5}$
12. $y = -\frac{3}{4}x - 1$ **parallel:** $y = -\frac{3}{4}x - 5$ **perpendicular:** $y = \frac{4}{3}x - \frac{40}{3}$
13. $y = -\frac{1}{2}x + \frac{3}{2}$; **parallel:** $y = -\frac{1}{2}x - 6$; **perpendicular:** $y = 2x - 16$
14. -82/3
15. -3
16. $y = -4x$
17. $y = \frac{6}{5}x + \frac{73}{5}$
18. $y = -\frac{2}{3}x + \frac{25}{3}$
19. $y = -\frac{6}{5}x - \frac{63}{5}$
20. Line a is perpendicular to b, No lines are parallel.
21. Vertical stretch with reflection by factor of -5/3, horizontal translation right 2 units, vertical translation up 7 units
22. Vertical stretch by a factor of 8, vertical translation down 3 units
23. Vertical shrink by a factor of 1/5, horizontal translation left 1 unit
24. None
25. Same as #20
26. (0,10)
27.
    a. No. It appears to make a pattern (U-shaped)
    b. $9.5 - 10.21 = -.71$
28. $y = -\frac{2}{15}x$
29. Parallelograms have opposite sides parallel. Parallel sides are congruent. Side AC is parallel to side BD because their slopes are 4, sides CD and AB are parallel because their slopes are 2/5.
30. This is not a square because all of the angles are not right angles. It is not a rhombus because opposite sides are not parallel.