

1. Slope $m = -5$ and y -intercept $b = 2$.
 $b = -\frac{1}{5}$.

3. Slope $m = 1$ and y -intercept $b = -2$.
 $b = \frac{2}{3}$.

5. Slope $m = \frac{2}{5}$ and y -intercept $b = -\frac{9}{5}$.
 $b = \frac{1}{4}$.

7. $y = \frac{x}{2}$.

9. $y = 4$.

11. $y = -x + 2$.

13. $y = -2x + 6$.

15. $y = -\frac{5}{2}x + 17$.

17. $y = -\frac{3}{4}x + \frac{17}{4}$.

18. The parallel line is $y = -3x$, and the perpendicular line is $y = \frac{x}{3}$.

19. The parallel line is $y = 2x - 5$. The perpendicular line is $y = -\frac{x}{2}$. Graph is below to the left.

2. Slope $m = \frac{2}{5}$ and y -intercept

4. Slope $m = \frac{1}{3}$ and y -intercept

6. Slope $m = 0$ and y -intercept

8. $y = -\frac{1}{3}(x + 7)$.

10. $y = -1$.

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

14. $y = -3x - 4$.

16. $y = \frac{1}{2}x - \frac{1}{2}$.

20. $y = -\frac{2}{3}x + \frac{4}{3}$. Graph is above to the right.

21. $y = -2x$.

22. $y = 2x - 2$.

23. Mass of the moon = 6.997×10^{22} kg.

24. $f = \frac{9}{5}c + 32$.

25. $T = N + 40$, where N = number of chirps in 15 seconds.

26. $N = 4T - 160$, where N is the number of chirps per minute.

27. It's a beautiful morning with a temperature of 24°C . We travel 8 km to a beautiful place to take a dive. The water temperature is 18°C with a breeze of 24 km per hour. We swim 366 m out to our dive spot where we submerge to a depth of 15 m. Among the animals that we see are 13 cm abalone, 36 cm lobsters, 5 cm banded gobies, and a 1.2 m leopard shark. At the end of the dive we surface 137 m from shore in 4.6 m of water. My tank gauge registers 49 kg/cm^2 of air remaining. (Note that metric countries often use SCUBA gauges in kg/square cm.)

28. It was a beautiful day to go cross-country skiing as the temperature is 18°F , so I packed a 9 lb pack, including 4.2 pints (or 68 oz.) of water. I travelled 43.5 miles North to the Laurentians where the elevation is about 1300 feet. The temperature in the mountains was perfect green wax conditions with 7°F and a breeze of 15.5 mph. The trail traversed 10.6 miles of maple forests with 16 inch diameter trees over an expanse of 11.6 miles^2 (or 7400 acres).

29. Average 6 year old is 114.5 cm. The average growth rate is 6.5 cm/yr.

30. The height of a 6-year-old is 111 cm. This should be less accurate, because the line is a best fit over a large age range, while the estimate above is over a smaller range.

31. The girl at age 10 is predicted to be 141.5 cm. At age 15, the model predicts she will be 173 cm. The first estimate is better, since it falls within the data points used to make

the line fit, an interpolation, whereas the height at age 15 is an extrapolation.

32. The equation for the puppy growth is $M = 0.6a + 0.9$. The slope of the line is 0.6. The intercept is the extrapolated birth weight of the puppy.

33. a. $k = 9$ and $b = 0.08$.

b. $A = 0.395$

c. $N = 0.026$ mg/ml

34. a. $k = 2.8$ and $b = 760$

b. $T = -271.4^\circ\text{C}$

35. a. Let y be the date and C be the concentration of CO_2 , then the linear equation is given by $C = 1.32y - 2275.1$ ppm.

b. This equation estimates the level of CO_2 in 2000 and 1950 as 364.9 ppm and 298.9 ppm, respectively. The model gives a negative value for C in 1620, so this does not make sense. The linear model is only valid over a limited range of time.

36. a. The equation is $T = -0.385d + 990.9$ secs, where T is the time for the mile and d is the date.

b. $d = 1950$.

c. $T = 220.9$ sec or 3 minutes 40.9 seconds.