

## Linear Functions/Equations

A person who weighs 220lbs goes on a diet hoping to lose 5lbs per week.

1. Write a linear function model that represents the person's weight after  $w$  weeks.

2. If Kameron is successful in his diet, how much will he weigh after 10 weeks?

3. Write a linear equation model that represents the month cost  $m$  of this cell phone plan if the user send  $t$  text messages.

4. If Jared sends 200 text messages, how much will he pay according to this plan?

Bang-up Motors will rent-a-wreck for \$25 plus \$0.15 per mile traveled.

5. Write a function expressing rental costs as a function of the miles traveled.

6. Find the costs of renting a car to travel 1200 miles.

7. What does the slope of the function represent in the real world?

8. What does the y-intercept represent in the real world?

9. How far would you have driven if your bill was \$61?

## Linear Inequalities

Jailin, a car salesman makes a monthly base salary of \$1500 and receives \$400 dollars for each car sold.

10. Write the inequality that gives the number of cars that he must sell to earn a monthly income of \$4,700.

The junior class is planning prom. The price of a prom ticket is \$23 per person. The cost of renting the building is \$1375, \$50 for security, \$575 for the DJ, and \$225 for the light show.

11. Write the inequality that shows the number of students the junior class needs to purchase tickets to make a profit of at least \$2570?

Yellow Cab Taxi charges a \$1.75 flat rate in addition to the 0.65 per mile. Katie has no more than \$10 to spend on a ride.

12. Write an inequality that represents Katie's situation.

13. How many miles can Katie travel with exceeding her limit?

During a special sale, all video games cost \$20 and all movies costs \$8. Jordan plans to spend some or all of his \$380 in birthday money on these movies and videos games.

14. Write an inequality that represents the situation.

## Systems of Linear Equations

The state fair is a popular field trip destination. This year the senior class at Lithia Springs High and the senior class at Douglas County High both planned trips there. The senior class at Lithia Springs High rented and filled 8 vans and 8 buses with 240 students. Douglas County High rented and filled 4 vans and 1 bus with 54 students. Every van had the same number of students in it as did the buses.

15. Find the number of students in each van and in each bus.

Mr. Lee is giving you a test worth 100 points containing 40 questions. There are two-point and four-point questions on the test.

16. How many of each type of question are on the test?

The math club and the science club had fundraisers to buy supplies for a hospice. The math club spent \$135 buying six cases of juice and one case of bottled water. The science club spent \$110 buying four cases of juice and two cases of bottled water.

17. How much did a case of juice cost? How much did a case of bottled water cost?

*At The Apple Pan, 4 burgers and 3 fries cost \$26.50. 5 burgers and 5 fries cost \$36.25.*

18. What is the cost for each item?

*At an ice cream parlor, ice cream cones cost \$1.10 and sundaes cost \$2.35. One day, the receipts for a total of 172 cone and sundaes were \$294.20.*

19. How many cones were sold?

*Daniel has 20 coins in her piggy bank, all dimes and quarters. The total amount of money is \$3.05.*

20. How many of each coin does she have?

*A McDonald's apple pie has 90 more calories than their chocolate chip cookie. Two apple pies and three cookies have a total of 980 calories.*

21. How many calories are in each item?

## **System of Linear Inequalities**

*Christopher can work at most 20 hours next week. He needs to earn at least \$92 to cover you weekly expenses. Christopher's dog-walking job pays \$7.50 per hour and his job as a car wash attendant pays \$6 per hour.*

22. Write a system of linear inequalities to model the situation.

*Heather is buying plants and soil for her garden. The soil cost \$4 per bag, and the plants cost \$10 each. She wants to buy at least 5 plants and can spend no more than \$100.*

22. Write a system of linear inequalities to model the situation.

Shontia is going to the store to buy candles. Small candles cost \$3.50 and large candles cost \$5.00. She needs to buy at least 20 candles, and she cannot spend more than \$80.

23. Write a system of linear inequalities that represent the situation.

Leejay is packing books into boxes. Each box can hold either 15 small books or 8 large books. He needs to pack at least 35 boxes and at least 350 books.

24. Write a system of linear inequalities to represent the situation.

## Multiple-Choice Question Practice

The STEM program at Lithia has decided to make and sell homemade cakes. They have spent \$75 on supplies, and they will sell each cake for \$5.

25. Which of the following functions  $P(x)$  represent the profit the STEM program would make on their cakes?

- a.  $P(x) = 75x + 5$
- b.  $P(x) = 75x - 5$
- c.  $P(x) = 5x - 75$
- d.  $P(x) = 5x + 75$

26. The STEM program will always make at least one sale. Which of the following sets could represent the domain of  $P(x)$ ?

- e.  $[-3, -1, 1, 3, 5, \dots]$
- f.  $[0, 0.5, 1, 1.5, 2, \dots]$
- g.  $[0, 1, 2, 3, 4, 5, \dots]$
- h.  $[1, 2, 3, 4, 5, \dots]$

27. How much profit would the STEM program make if they sold 50 cakes?

- i. \$30
- j. \$5
- k. \$175
- l. \$100

28. How many cakes would the STEM program have to sell to make \$1250 in profit?

- m. 16
- n. 235
- o. 265
- p. 17

You have decided that to make some extra money this summer, you will build and sell wooden wells. To get started, you had to pay \$775 for the supplies and you will sell each well for \$85. Your profit can be represented by the function  $P(x) = 85x - 775$ .

29. How many wells will you have to sell to begin making a profit?

- a. 8
- b. 9
- c. 10
- d. 11

30. How much profit could you make if you sold 25 wells?

- e. \$1250
- f. \$1300
- g. \$1325
- h. \$1350

31. How many wells would you have to sell to make \$2625 in profit?

- i. 40
- j. 41
- k. 42
- l. 43

32. Blair is tracking the progress of her plant's growth. Today the plant is 5 cm high. The plant grows 1.5 cm per day. What function rule best describes the growth of the plant where  $d$  represents the number of days the plant has grown and  $h$  represents the height of the plant in centimeters?

- a.  $h(d) = 1.5d + 5$
- b.  $h(d) = 5d + 1.5$
- c.  $h(d) = \frac{d}{1.5} + 5$
- d.  $h(d) = 1.5d$

33. You are riding in a car averaging 75 miles per hour. The distance,  $D$ , you travel is a function of the number of hours,  $h$ , you travel at that rate. Which of the following functions correctly models your distance traveled?

- e.  $D(h) = 75$
- f.  $D(h) = 75 + 4$
- g.  $D(h) = 75h$
- h.  $D(h) = \frac{75}{h}$

Jakob has started selling donuts to make money for his football team. His profit can be represented by the function  $P(x) = 3x - 50$ , where  $P(x)$  represents the profit made after  $x$  number of donuts have been sold.

34. How many donuts does Jacob have to sell to begin making a profit?

- i. 15
- j. 16
- k. 17
- l. 18

35. How much profit will Jacob make if he sells 40 donuts?

- m. \$70
- n. \$75
- o. \$80
- p. \$85

36. How many donuts will Jacob have to sell to make a profit of \$145?

- q. 60
- r. 65
- s. 70
- t. 75