

Lesson 3.3 (Day 1)

Modeling with Functions

What are some factors that will effect how much a flower grows in a garden?

Amount of sunlight, water, soil quality

Independent Variable - the variable that changes and impacts the dependent variable.

This is the "input" of a function.

x is typically the independent variable

Dependent Variable - the variable that changes based on the independent variable.

This is the "output" of a function.

y is typically the dependent variable

Identify the dependent and independent variables in each situation.

1. The cost of shipping a package is based on how much it weighs.

indep: weight of package
dep: weight of package

2. The faster Tom walks, the quicker he will get home.

indep: Speed Tom walk
dep: time to get home

3. A students' test grade depends on how much they study.

indep: amount of time studying
dep: Test grade

4. The amount of fertilizer that is spread will determine how tall the grass gets.

indep: Amt. of Fertilizer used
dep: height of grass

We use FUNCTION NOTATION (where $y = f(x)$) to represent the independent and dependent variables.

$f(x)$ = dependent variable (output) (x) = independent variable (input)

Amanda babysits and charges \$10 per hour. Determine the independent and dependent variables, then write an equation in function notation.

Let x = number of hours (indep)

$f(x)$ = Amount charged (dep)

$$f(x) = 10x$$

Identify the independent and dependent variables for each situation. Then write an equation in function notation. Finally, use that equation to solve the problem.

1. A lawyer's fee is \$180 per hour for his services. How much does the lawyer charge for 5 hours?

indep, $x = \# \text{ of hours}$
dep, $f(x) = \text{Total Charge}$

$$f(x) = 180x$$

$$f(5) = 180(5)$$

$$f(5) = 900$$

2. The admission fee at a carnival is \$9. Each ride costs \$1.75. How much does it cost to go to the carnival and then go on 12 rides?

$x = \# \text{ of rides}$

$f(x) = \text{Total cost of carnival}$

$$f(x) = 9 + 1.75x$$

$$f(12) = 9 + 1.75(12)$$

$$f(12) = \$30$$

3. Kate earns \$7.50 per hour. How much money will she earn after working 8 hours?

$x = \# \text{ of hours}$

$f(x) = \text{Amount earned}$

$$f(x) = 7.50x$$

$$f(8) = 7.50(8)$$

$$f(8) = \$60$$

4. The price for a movie ticket is \$12. A bucket of medium popcorn is \$5. How much will it cost to go to a movie and buy 2 buckets of popcorn?

$x = \# \text{ of buckets of popcorn}$

$f(x) = \text{Total Cost}$

$$f(x) = 12 + 5x$$

$$f(2) = 12 + 5(2)$$

$$f(2) = 22$$

5. Cindy is buying jackets for her local community charity. Each jacket costs \$50. If Cindy bought 23 jackets, what is the total cost?

$x = \# \text{ of jackets}$

$f(x) = \text{total cost}$

$$f(x) = 50x$$

$$f(23) = 50(23)$$

$$f(23) = 1150$$

6. James went to the carnival and played skee ball. If he played the game 15 times, at \$2 per game, how much did he spend?

$x = \# \text{ of times playing game}$

$f(x) = \text{Total Cost}$

$$f(x) = 2x$$

$$f(15) = 2(15)$$

$$f(15) = 30$$