

2-5 Reteaching

Writing a Function Rule

When writing function rules for verbal descriptions, you should look for key words.

Words that Suggest Addition	Words that Suggest Subtraction	Words that Suggest Multiplication	Words that Suggest Division
plus	minus	times	divided by
sum	difference	product	quotient
more than	less than	of	rate
increased by	decreased by	each	ratio
total	fewer than	factors	half
in all	subtracted by	twice	a third of

Problem

Twice a number n increased by 4 equals m . What is a function rule that represents the sentence?

$$\underbrace{\text{twice a number } n}_{2n} \quad \underbrace{\text{increased by 4}}_{+4} \quad \underbrace{\text{equals}}_{=} \quad \underbrace{m}_{m}$$

The function rule is $2n + 4 = m$.

Exercises

Write a function rule that represents each sentence.

1. t is 4 more than the product of 7 and s .

$$t = 7s + 4$$

3. 8 fewer than p times 3 equals x .

$$3p - 8 = x$$

5. k equals the sum of h and 23.

$$k = h + 23$$

7. m equals 5 times n increased by 6.

$$m = 5n + 6$$

9. 5 more than the product of 6 and n is 17.

$$6n + 5 = 17$$

2. The ratio of a to 5 equals b .

$$\frac{a}{5} = b$$

4. y is half of x plus 10.

$$y = \frac{1}{2}x + 10$$

6. 15 minus twice a equals b .

$$15 - 2a = b$$

8. 17 decreased by three times d equals c .

$$17 - 3d = c$$

10. d is 8 less than the quotient of b and 4.

$$d = \frac{b}{4} - 8$$

2-5 Reteaching (continued)

Writing a Function Rule

You can write functions to represent situations and then evaluate the function to determine a particular value.

Problem

A sales associate earns \$500 per week plus 4% of his sales. Write a function rule for the amount he makes in a week if he sells s dollars of merchandise. How much will he make if he sells \$4000 worth of merchandise?

First write the function rule.

$$\underbrace{\text{earnings}}_e \quad \underbrace{\text{equals}}_= \quad \underbrace{500}_{500} \quad \underbrace{\text{plus}}_+ \quad \underbrace{4\% \text{ of sales}}_{0.04s}$$

Use this function rule to calculate how much he will make.

$$\begin{aligned} e &= 500 + 0.04s \\ &= 500 + 0.04(4000) \\ &= 700 \end{aligned}$$

He will make \$700.

Exercises

11. Twelve cans of peaches are placed into each box. Write a function rule for the number of boxes needed for c cans. How many boxes are needed for 1440 cans?

$$b = \frac{c}{12}$$

$$b = \frac{1440}{12} = 120$$

12. Tara plans to rent a car for the weekend. The cost to rent the car is \$45 plus \$0.15 for each mile she drives. Write a function rule for the total cost of the rental. How much is the rental if she travels 500 miles?

$$C = 0.15m + 45$$

$$C = 120$$

$$C = 0.15m + 45$$

$$C = 0.15(500) + 45$$

13. A plumber charges \$60 for a service call plus \$55 for each hour she works. Write a function rule for the total bill for a plumbing job. What is the total bill for a job that takes the plumber 3 hours of work?

$$B = 55h + 60$$

$$B = 55(3) + 60$$

$$B = 225$$

14. Tickets to a concert cost \$45 per ticket plus a \$10 processing fee for each order. Write a function rule for the total cost of ordering tickets. What is the total cost to order 6 tickets?

$$C = 45t + 10$$

$$C = 45(6) + 10$$

$$C = 280$$

2-5 Practice

Form K

Writing a Function Rule

Write a function rule that represents each sentence.

1. 8 less than one third of
- x
- is
- y
- .

$$\frac{1}{3}x - 8 = y$$

2. 12 more than the quotient of a number
- t
- and 7 is
- v
- .

$$\frac{t}{7} + 12 = v$$

- 3.
- z
- is 6 more than twice
- y
- .

$$z = 2y + 6$$

4. 10 more than 8 times a number
- a
- is
- b
- .

$$8a + 10 = b$$

For Exercises 5–7, write a function rule that represents each situation.

5. The price
- p
- of a large, cheese pizza is \$7.95 plus \$.75 for each topping
- t
- on the pizza.

$$p = .75t + 7.95$$

$$y = m \times t + b$$

6. Jaquelyn's earnings
- m
- are a function of the number of lawns
- n
- she mows at a rate of \$12 per lawn.

$$m = 12n$$

7. The total fees
- f
- of a book club membership are \$10 per month
- m
- and a one-time administrative fee of \$4.75.

$$f = 10m + 4.75$$

$$y = m \times t + b$$

8. Eric is 2 years younger than 2 times his sister's age. Write a rule that represents Eric's age
- a
- as a function of his sister's age
- s
- . How old is Eric if his sister is 11?

$$a = 2s - 2$$

$$a = 2(11) - 2$$

$$a = 22 - 2$$

$$a = 20$$

2-5 Practice (continued)

Form K

Writing a Function Rule

9. An online music club charges \$5.75 for the first music download and \$2 for each additional download per month. Write a rule for describing the total monthly fees f as a function of additional downloads d . What are the fees for 15 music downloads in a month?

$$f = 2d + 5.75$$

$$f = 2(14) + 5.75 = 28 + 5.75 = 33.75$$

10. Write a function rule for the area of a rectangle whose length is 6 ft more than its width. What is the area of the rectangle when its width is 12 ft?

$$A = Bh$$

$$A = Lw$$

$$A = (w+6)(w)$$

$$A = w^2 + 6w$$

$$A = (12)^2 + 6(12)$$

$$A = 144 + 72$$

$$A = 216$$

11. Write a function rule for the area of a rectangle with a length 7 m more than three times its width. What is the area of the rectangle when its width is 3 m?

$$A = LW$$

$$A = (3w+7)w$$

$$A = 3w^2 + 7w$$

$$A = 3(3)^2 + 7(3)$$

$$A = 3(9) + 21$$

$$A = 27 + 21$$

12. Write a function rule for the area of a triangle with a base 10 cm less than 8 times its height. What is the area of the triangle when its height is 5 cm?

$$A = 48 \text{ m}^2$$

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(8h-10)(h)$$

$$A = \frac{1}{2}(8h^2 - 10h)$$

13. Reasoning Is the graph of a function that relates a square's side length to its perimeter continuous or discrete? Explain.

$$A = 4h^2 - 5h$$

14. Open-Ended Describe a real-world situation that can be represented by a linear function. Describe a change that could occur in this situation that would change it to a nonlinear function.

$$A = 4(5)^2 - 5(5)$$

$$A = 4(25) - 25$$
~~$$A = 100 - 25$$~~

$$A = 75$$