Applications of Finding Linear Functions

Bell Work:

1. **What type is this linear function?** $3x - 5y = -20$
2. **What is the slope of the line with an equation of** $2x + 7y = 18$?
3. **What is the equation in slope-intercept form of a line that has a slope of** $-\frac{2}{3}$ **and goes through (-9, 5)?**
4. **What is the range for the linear parent function?**

Applications of Finding Linear Functions

Find the linear function and use the function to solve word problems.

$y = .60x + 10$

$y = -2.5x + 75$

$y = .20x + 100$

$y = 200x + 500$

Applications of Finding Linear Functions

Thomas visited New York City for 2 weeks, taking taxi cabs to visit places. One trip he spent $22 to travel 20 miles. The taxis charge a base rate and $0.60 per mile. What is the function for the cost of riding in the taxi?

We have the slope (cost per mile).

$$y - 22 = .60(x - 20)$$

$$y - 22 = .60x - 12$$

$$y = .60x + 10$$

Applications of Finding Linear Functions

Thomas visited New York City for 2 weeks, taking taxi cabs to visit places. One trip he spent $22 to travel 20 miles. The taxis charge a base rate and $0.60 per mile. What is the function for the cost of riding in the taxi?

How much would it cost Thomas to travel 30 miles?

$$y = .60(30) + 10 = 28$$

It would cost $28.

Applications of Finding Linear Functions

Thomas visited New York City for 2 weeks, taking taxi cabs to visit places. One trip he spent $22 to travel 20 miles. The taxis charge a base rate and $0.60 per mile. What is the function for the cost of riding in the taxi?

How far did Thomas travel if one taxi ride was $35.80?

$$35.80 = .60x + 10$$

$$25.80 = .60x$$

$$43 = x$$

He traveled 43 miles.

Applications of Finding Linear Functions

A large tank is full of water. A drain is opened and it drains at a rate of 2.5 gallons per minute. After 6 minutes, there is 60 gallons left in the tank. What is the function to find the amount of water in the tank?

We have the slope (rate of water draining).

$$y - 60 = -2.5(x - 6)$$

$$y - 60 = -2.5x + 15$$

$$y = -2.5x + 75$$

The slope is negative because the water is draining from the tank.

Applications of Finding Linear Functions

A large tank is full of water. A drain is opened and it drains at a rate of 2.5 gallons per minute. After 6 minutes, there is 60 gallons left in the tank. What is the function to find the amount of water in the tank?

How much water was there after 20 minutes?

$$y = -2.5(20) + 75 = 25$$

There was 25 gallons in the tank.

Applications of Finding Linear Functions

A large tank is full of water. A drain is opened and it drains at a rate of 2.5 gallons per minute. After 6 minutes, there is 60 gallons left in the tank. What is the function to find the amount of water in the tank?

How long would it take for the tank to empty out?

$$0 = -2.5x + 75$$

$$-75 = -2.5x$$

$$30 = x$$

It would take 30 minutes.

Applications of Finding Linear Functions

Sally works at a local electronics store. She gets a weekly salary and a commission. One week she earned $400, when she sold $1,500 of electronics. The next week she sold $3,500 and earned $800. What is the linear function for Sally's pay?

Find the slope (her rate of pay).

$$\frac{400-800}{1{,}500-3{,}500}=\frac{-400}{-2000}=.20$$

$$y-400=.20(x-1{,}500)$$

$$y-400=.20x-300$$

$$y=.20x+100$$

Applications of Finding Linear Functions

Sally works at a local electronics store. She gets a weekly salary and a commission. One week she earned $400, when she sold $1,500 of electronics. The next week she sold $3,500 and earned $800. What is the linear function for Sally's pay?

How much would she earn if she sold $2,000?

$$y = .20(2000) + 100 = 500$$

She would earn $500.

Applications of Finding Linear Functions

Sally works at a local electronics store. She gets a weekly salary and a commission. One week she earned $400, when she sold $1,500 of electronics. The next week she sold $3,500 and earned $800. What is the linear function for Sally's pay?

How much would she have to sell to earn $900?

$$900 = .20x + 100$$

$$800 = .20x$$

$$4{,}000 = x$$

She would need to have sales of $4,000.

Applications of Finding Linear Functions

Mary is going to record some songs that she wrote. The local recording studio charges a flat rate and an hourly rate. Mary spent $2,100 for 8 hours. If she used 12 hours, it would have cost her $2,900. What is the linear function of renting the recording studio?

Find the slope (her rate of pay).

$$\frac{2{,}100 - 2{,}900}{8 - 12} = \frac{-800}{-4} = 200$$

$$y - 2{,}100 = 200(x - 8)$$

$$y - 2{,}100 = 200x - 1600$$

$$y = 200x + 500$$

Applications of Finding Linear Functions

Mary is going to record some songs that she wrote. The local recording studio charges a flat rate and an hourly rate. Mary spent $2,100 for 8 hours. If she used 12 hours, it would have cost her $2,900. What is the linear function of renting the recording studio?

How much would it cost her if she spent 5 hours to record her songs?

$y = 200(5) + 500 = 1{,}500$

It would cost her $1,500.

Applications of Finding Linear Functions

Mary is going to record some songs that she wrote. The local recording studio charges a flat rate and an hourly rate. Mary spent $2,100 for 8 hours. If she used 12 hours, it would have cost her $2,900. What is the linear function of renting the recording studio?

How long did she use the studio if she paid $4,300?

$$4{,}300 = 200x + 500$$

$$3{,}800 = 200x + 500$$

$$19 = x$$

She used the studio for 19 hours.

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Assignment:

FLUENCY PRACTICE: Applications of Finding Linear Functions Worksheet