

LESSON 2.2 Skills Practice

Name _____ Date _____

What Goes Up Must Come Down Analyzing Linear Functions

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Problem Set

Complete the table to represent each problem situation.

1. A hot air balloon cruising at 1000 feet begins to ascend. It ascends at a rate of 200 feet per minute.

	Independent Quantity	Dependent Quantity
Quantity	Time	Height
Units	minutes	feet
	0	1000
	2	1400
	4	1800
	6	2200
	8	2600
Expression	t	$200t + 1000$

2. A bathtub contains 10 gallons of water. The faucet is turned on and fills the tub at a rate of 5.25 gallons per minute.

	Independent Quantity	Dependent Quantity
Quantity		
Units		
	0	
	1	
	3	
		36.25
		46.75
Expression		

3. A helicopter flying at 4125 feet begins its descent. It descends at a rate of 550 feet per minute.

	Independent Quantity	Dependent Quantity
Quantity		
Units		
	0	
	1	
	2	
		2475
		1925
Expression		

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4. A fish tank filled with 12 gallons of water is drained. The water drains at a rate of 1.5 gallons per minute.

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	Independent Quantity	Dependent Quantity
Quantity		
Units		
	0	
	1	
	3	
		4.5
		1.5
Expression		

5. A submarine is traveling at a depth of -300 feet. It begins ascending at a rate of 28 feet per minute.

	Independent Quantity	Dependent Quantity
Quantity		
Units		
	0	
	2	
	4	
		-132
		-76
Expression		

6. A free-diver is diving from the surface of the water at a rate of 15 feet per minute.

	Independent Quantity	Dependent Quantity
Quantity		
Units		
	0	
	1	
	2	
		-45
		-60
Expression		

Identify the input value, the output value, the y-intercept, and the rate of change for each function.

7. A hot air balloon at 130 feet begins to ascend. It ascends at a rate of 160.5 feet per minute. The function $f(t) = 160.5t + 130$ represents the height of the balloon as it ascends. The input value is t , time in minutes. The output value is $f(t)$, height in feet. The y-intercept is 130. The rate of change is 160.5.
8. A backyard pool contains 500 gallons of water. It is filled with additional water at a rate of 6 gallons per minute. The function $f(t) = 6t + 500$ represents the volume of water in the pool as it is filled.
9. A submarine is diving from the surface of the water at a rate of 17 feet per minute. The function $f(t) = -17t$ represents the depth of the submarine as it dives.

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10. A helicopter flying at 3505 feet begins its descent. It descends at a rate of 470 feet per minute. The function $f(t) = -470t + 3505$ represents the height of the helicopter as it descends.

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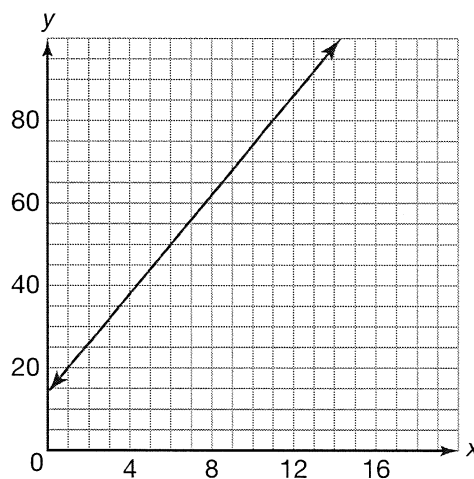
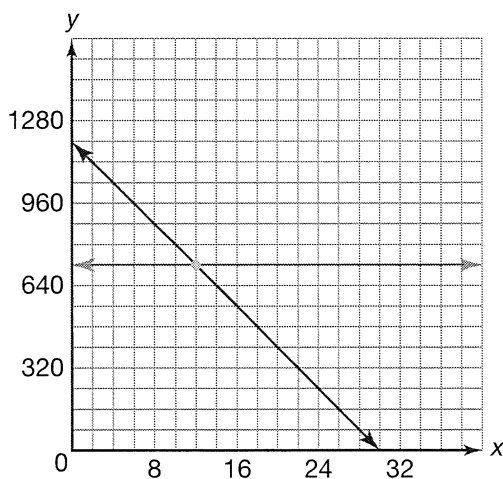
11. A bathtub contains 5 gallons of water. The faucet is turned on and water is added to the tub at a rate of 4.25 gallons per minute. The function $f(t) = 4.25t + 5$ represents the volume of water in the bathtub as it is filled.

12. A free-diver is diving from the surface of the water at a rate of 8 feet per minute. The function $f(t) = -8t$ represents the depth of the diver.

Sketch the line for the dependent value to estimate each intersection point.

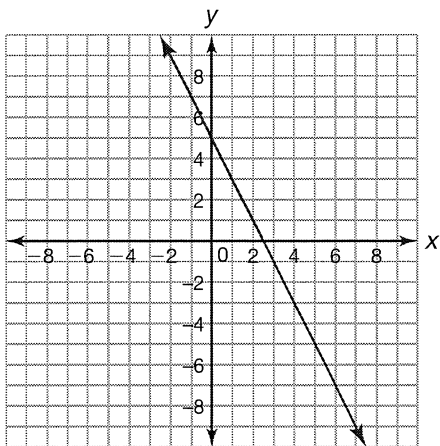
13. $f(x) = -40x + 1200$ when $f(x) = 720$

14. $f(x) = 6x + 15$ when $f(x) = 75$

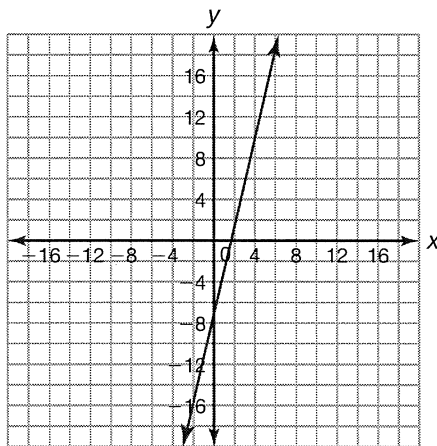


Answers will vary.
 $f(x) = 720$ at $x = 12$

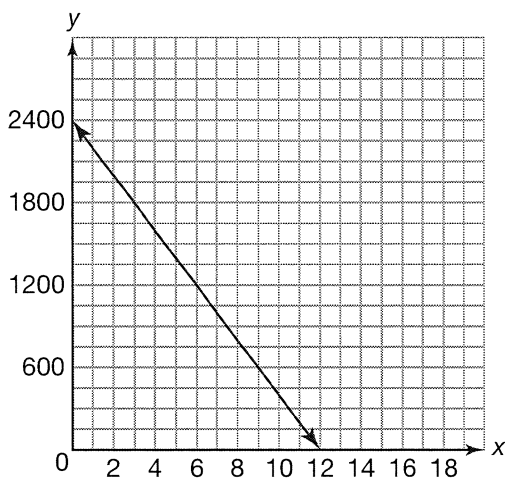
15. $f(x) = -2x + 5$ when $f(x) = -7$



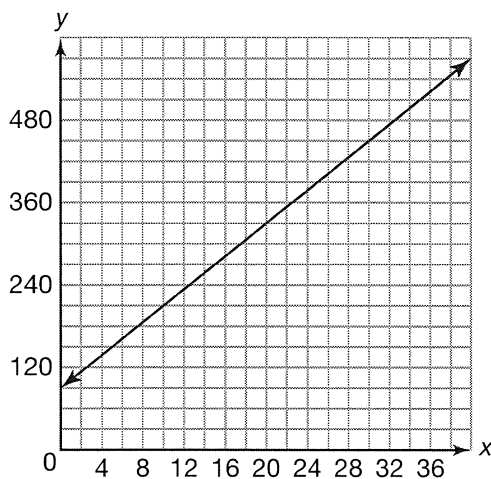
16. $f(x) = 4x - 7$ when $f(x) = 8$



17. $f(x) = -200x + 2400$ when $f(x) = 450$



18. $f(x) = 12x + 90$ when $f(x) = 420$



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Substitute and solve for x to determine the exact value of each intersection point.

19. $f(x) = -40x + 1200$ when $f(x) = 720$

$$f(x) = -40x + 1200$$

$$720 = -40x + 1200$$

$$-480 = -40x$$

$$12 = x$$

20. $f(x) = 6x + 15$ when $f(x) = 75$

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21. $f(x) = -2x + 5$ when $f(x) = -7$

22. $f(x) = 4x - 7$ when $f(x) = 8$

23. $f(x) = -200x + 2400$ when $f(x) = 450$

24. $f(x) = 12x + 90$ when $f(x) = 420$