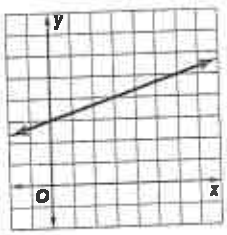
Name: _____ Math 8

LINEAR AND NONLINEAR FUNCTIONS

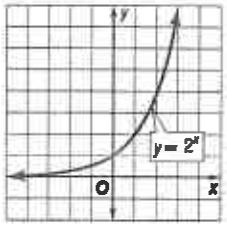
Linear functions represent a constant rate of change. When graphed, a linear function will always represent a straight line.

Nonlinear functions do not have constant rates of change. When graphed, a nonlinear function will not be a straight line.

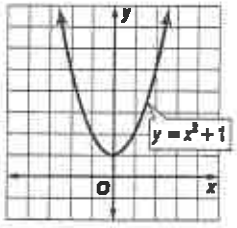
Model problems:

1. 

Linear; graph is a straight line.

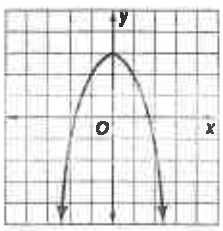
2. 

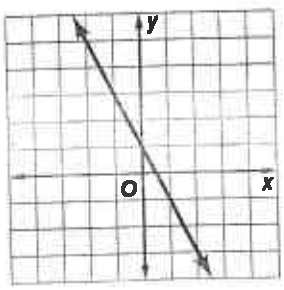
This graph is also a curve, so it represents a nonlinear function.

3. 

The graph is a curve, not a straight line, so it represents a nonlinear function.

Directions: Determine whether each graph is a linear or non-linear function.

1. 

2. 

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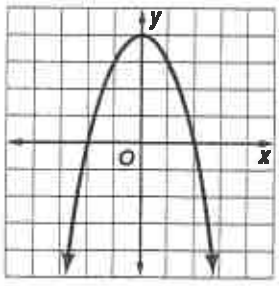

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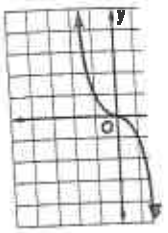

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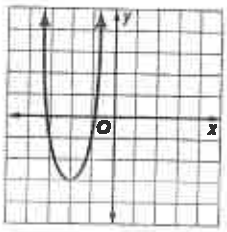

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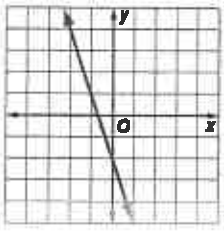

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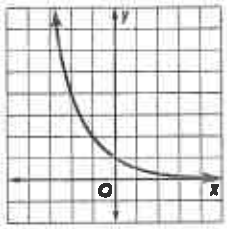

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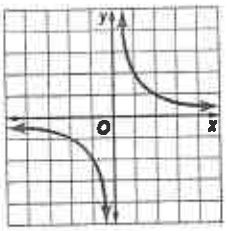

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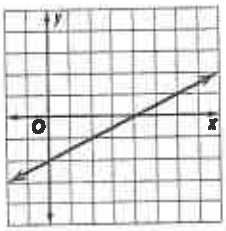
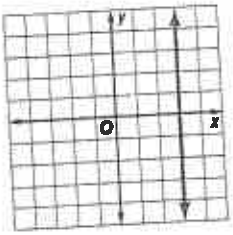


10.



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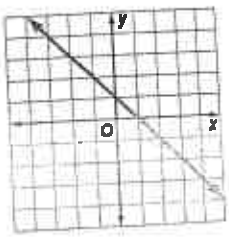

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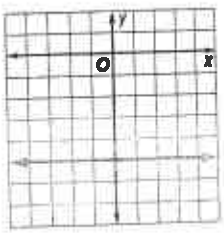

Problems 13 - 22, identify each function as linear or quadratic.

13. $y = 3x^2$

14. $y = 2x + 1$

15. $y = x^2$

16. $y = 0.5x^2$

17. $y + x = 2$

18. $y = 3x^2 - 2x + 6$

19. $y = x^2 + 4x - 8$

20 $y + x^2 = 5x - 9$

21. $y = x$

22. $y = x + 3$

Problems 23 – 31, identify as either linear or quadratic.

23.

x	y
1	5
2	7
3	9
4	11

24.

x	y
1	3
2	6
3	11
4	18

25.

x	y
0	3
2	6
4	9
6	12

26.

x	y
- 2	7
1	4
4	1
7	- 2

27.

x	y
0	3
1	4
2	7
3	12

28.

x	y
2	- 1
3	4
4	11
5	20

29. { (0, 1), (1, 4), (2, 7), (3, 10) }

30. { (0, 0), (1, 1), (2, 4), (3, 9) }

31. { (1, 5), (2, 8), (3, 13), (4, 20) }

Problems 32 – 35, identify each word form as either linear or quadratic.

32. The temperature steadily increased throughout the morning.

33. The height in feet of a golf ball that is hit.

34. A submarine that steadily goes deeper into the ocean.

35. A juggler that tosses rings.

Multiple Choice:

36. Which equation describes a linear function?

A. $V = s^3$

B. $y = \frac{1}{6}x$

C. $y = (2)^x$

D. $A = \pi r^2$

37. Which set of ordered pairs (x, y) could represent a linear function of x?

A. { (- 2, 8), (0, 4), (2, 3), (4, 2) }

B. { (1, 2), (1, 3), (1, 4), (1, 5) }

C. { (- 2, 7), (0, 12), (2, 17), (4, 22) }

D. { (3, 5), (4, 7), (3, 9), (5, 11) }