

Name: \_\_\_\_\_  
8.F.3

Date: \_\_\_\_\_

\_\_\_\_1. Which equation does **not** represent a linear function of  $x$ ? (2013)

- A.  $y = -\frac{3}{4}x$       B.  $y = \frac{x}{2}$       C.  $y = -3 + 2x$       D.  $y = 3x^2 - 2$

\_\_\_\_2. Which phrase describes a nonlinear function? (2014)

- A. the area of a circle as a function of the radius  
B. the perimeter of a square as a function of the side length  
C. the cost of gasoline as a function of the number of gallons purchased  
D. the distance traveled by a car moving at constant speed as a function of time

\_\_\_\_3. Which equation represents a linear function? (2014)

- A.  $y = \frac{4}{x} + 1$       B.  $y = x^2 + 2$       C.  $y = \sqrt[3]{x + 1}$       D.  $y = -\frac{2}{3}x - \frac{1}{2}$

\_\_\_\_4. Which equation does **not** represent a linear function? (2015)

- A.  $y = 2(x - 3)$       B.  $y = 2^2 - 3x$       C.  $y = \frac{x+1}{5}$       D.  $y = 2x^2 + 3x$

\_\_\_\_5. Which of the equations listed below are linear equations? (2016) (no calculator)

Equation I:  $C = 2\pi r$       Equation II:  $A = \pi r^2$       Equation III:  $V = \frac{4}{3}\pi r^3$

- A. equation I only      B. equation II only      C. equations I and III      D. equations II and III

\_\_\_\_6. Which equation represents a nonlinear function? (2016)

- A.  $y = -3x + 1$       B.  $y = x^2 + 1$       C.  $y = \frac{x}{2} + 1$       D.  $y = 2x + \frac{1}{2}$

\_\_\_\_7. Which statement explains the type of function that is represented by the equation  $y = x^2 + 9$ ? (2017) no calculator

- A. The function is linear because it contains more than one term.  
B. The function is linear because the variable  $x$  is raised to the second power.  
C. The function is nonlinear because it contains more than one term.  
D. The function is nonlinear because the variable  $x$  is raised to the second power.

\_\_\_\_8. The points  $(2, -2)$  and  $(-4, 13)$  lie on the graph of a linear function of  $x$ . Which point also lies on the graph of this function? (2017)

- A.  $(-6, 18)$       B.  $(-1, 5)$       C.  $(7, 14.5)$       D.  $(13, -4)$

\_\_\_9. Which table of values represents a linear function?

(2016) (no calculator)

A

$x$	$y$
0	0
1	1
4	16
9	81

C

$x$	$y$
0	0
1	2
4	8
9	18

B

$x$	$y$
0	1
1	3
4	9
9	20

D

$x$	$y$
0	0
1	2
4	4
9	6

\_\_\_10. Which equation describes a linear function?

A.  $V = s^3$

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

C.  $y = (2)^x$

D.  $A = \pi r^2$

\_\_\_11. Which set of ordered pairs:  $(x, y)$  could represent a linear function of  $x$  ?

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

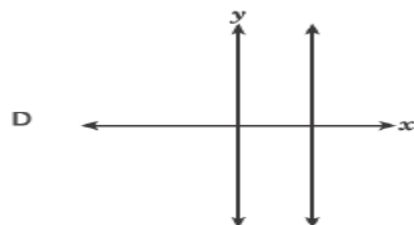
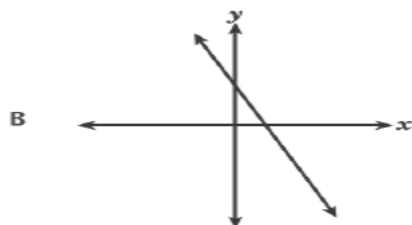
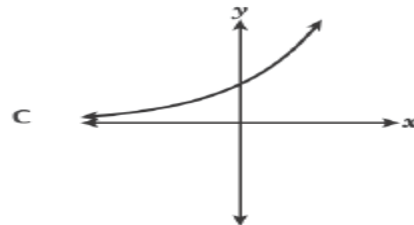
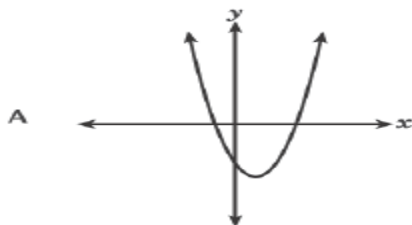
C.  $\{(-2, 7), (0, 12), (2, 17), (4, 22)\}$

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

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

\_\_\_12. Which graph represents a linear function of  $x$  ?

(2019 and 2021)



\_\_\_\_13. Which equation represents a function of  $x$  that is **not** linear? (2019 and 2021)

- A.  $y = 4(x + 3)$       B.  $y = 4^2 + 3x$       C.  $y = 4x + 3x^2$       D.  $y = \frac{4 + x}{3}$

14. Does the equation below define a linear function? (2014)

$$y = \frac{3}{x}, \text{ when } x \neq 0$$

*Explain how you got your answer.*

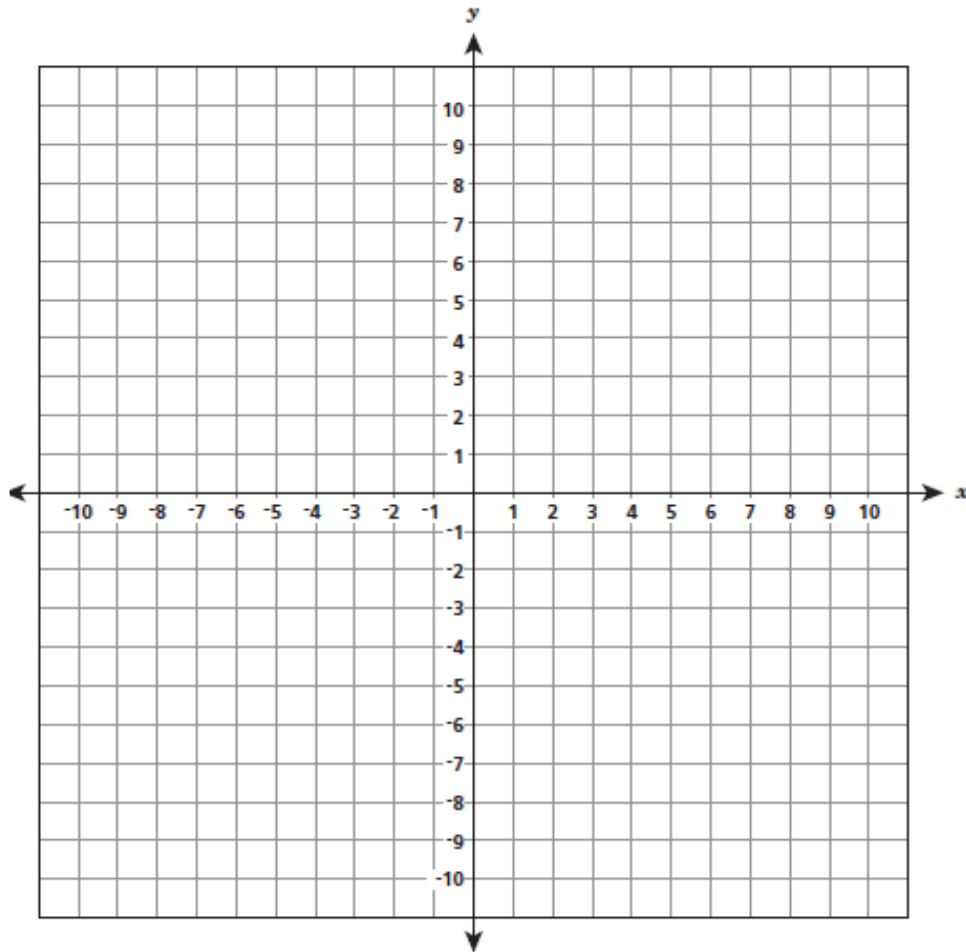
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15. A certain function is defined as “multiply the input by  $-\frac{3}{4}$ , then add 2.” (2015)

Graph the function on the coordinate plane below.



16. Write an equation of a function that is not linear.

(2016)

**Answer** \_\_\_\_\_

Use your equation to explain why your function is not linear.

**Answer**

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17. Four equations are shown below.

(2017)

**Equation 1:**  $y = 2^x$

**Equation 3:**  $y = x^2 + 6$

**Equation 2:**  $y = 2x - 5$

**Equation 4:**  $y = \frac{x}{2}$

Identify one linear equation and one nonlinear equation from the list. State a reason why each equation you identified is linear or nonlinear.

**Linear equation** \_\_\_\_\_

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**Nonlinear equation** \_\_\_\_\_

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18. The ordered pairs below represent a linear function.

(2018)

$$\left(\frac{3}{4}, 6\frac{1}{4}\right), \left(1\frac{1}{4}, 7\frac{3}{4}\right), (x, y)$$

Which values could be the values of  $x$  and  $y$  ?

**Answer**  $x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

19. The set of ordered pairs below represents a linear function. (2019)

$$\{(-2, -3), (0, -2), (2, -1), (x, y)\}$$

What is one other pair of coordinates that could be the missing ordered pair,  $(x, y)$ , in this set?

**Show your work.**

*Answer*  $x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

20. The two equations shown below represent different functions. (2019)

**Function P:**  $y = \frac{3}{x} + 2$

**Function Q:**  $y = \frac{1}{3}x + 2$

Identify each function as linear or nonlinear. State a reason why each function is linear or nonlinear.

**Function P** \_\_\_\_\_

**State your reason.**

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**Function Q** \_\_\_\_\_

**State your reason.**

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21. Three equations are listed below.

(2022)

- $y = x(3x + 2)$
- $y = \frac{x}{3} + 2$
- $y = 2 - 3x$

Identify one linear equation and one nonlinear equation from the list. State a reason why each equation you identified is linear or nonlinear.

**Linear equation** \_\_\_\_\_

*State your reason*

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**Nonlinear equation** \_\_\_\_\_

*State your reason*

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