

Functions 8.F.3 Pre-Test

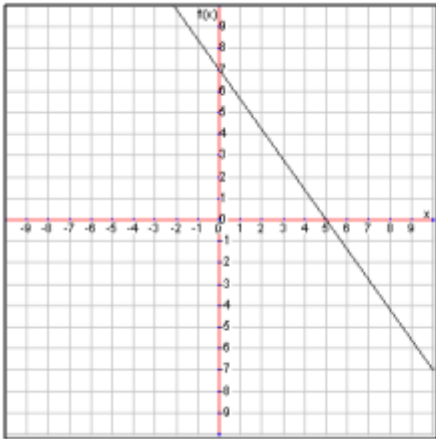
Please do not use a calculator.

Determine whether the following functions are linear or non-linear and explain how you know.

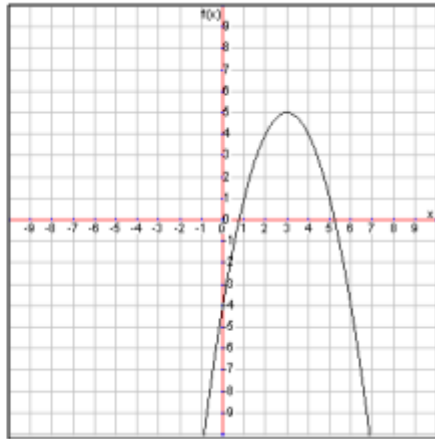
1. $y = x^3$

2. $y = \frac{3}{4}x + 1$

3.



4.



5.

x	-2	-1	0	1	2
y	1	2	5	10	17

6.

x	3	5	7	9	11
y	2	1	0	-1	-2

7. Input: # of hours worked
Output: Total pay at an hourly rate

8. Input: Your age
Output: The input squared plus seven

Answer the following question about different types of functions.

9. Give an example of a non-linear function in equation form and explain how you know it is non-linear.

10. Give an example of a linear function in equation form and explain how you know it is linear.

11. Give an example of a non-linear function in table form and explain how you know it is non-linear.

12. Give an example of a linear function in table form and explain how you know it is linear.

13. Give an example of a non-linear function in a verbal description and explain how you know it is non-linear.

14. Give an example of a linear function in a verbal description and explain how you know it is linear.

15. Feivel thinks a table represents a linear function because there is a pattern in the change in outputs. Does his reasoning make sense? Why or why not?

16. Pesha thinks the equation $y = \sqrt{x}$ is a linear function because there is no exponent. Do you agree with her? Why or why not?

Adapted from Eric Bright, Charleston Middle School Curriculum

Functions 8.F.3 Pre-Test Answers

Please do not use a calculator.

Determine whether the following functions are linear or non-linear and explain how you know.

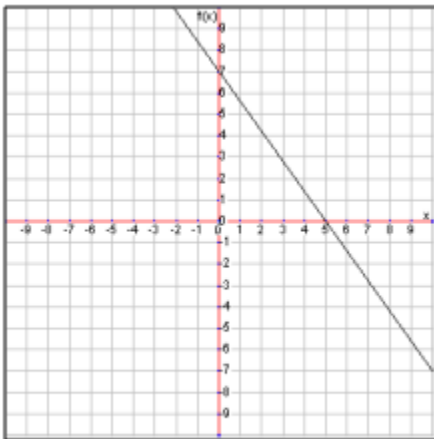
1. $y = x^3$

Non-linear because exponent on input will not give a constant rate of change.

2. $y = \frac{3}{4}x + 1$

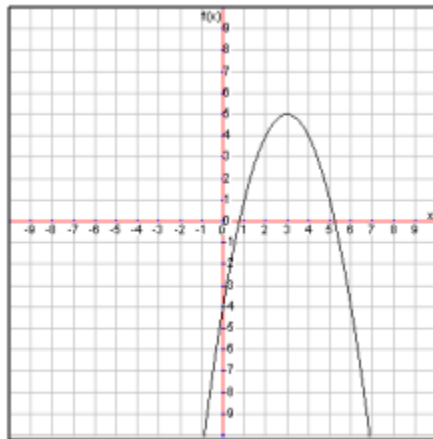
Linear because it is the form $y = mx + b$.

3.



Linear because it's a straight line.

4.



Non-linear because it's not a straight line.

5.

x	-2	-1	0	1	2
y	1	2	5	10	17

Non-linear because no constant rate of change.

6.

x	3	5	7	9	11
y	2	1	0	-1	-2

Linear because of a constant rate of change.

7. Input: # of hours worked

Output: Total pay at an hourly rate

Linear because it has an hourly rate (of change).

8. Input: Your age

Output: The input squared plus seven

Non-linear because you square the input.

Answer the following question about different types of functions.

9. Give an example of a non-linear function in equation form and explain how you know it is non-linear.

Answers will vary.

10. Give an example of a linear function in equation form and explain how you know it is linear.

Answers will vary.

11. Give an example of a non-linear function in table form and explain how you know it is non-linear.

Answers will vary.

12. Give an example of a linear function in table form and explain how you know it is linear.

Answers will vary.

13. Give an example of a non-linear function in a verbal description and explain how you know it is non-linear.

Answers will vary.

14. Give an example of a linear function in a verbal description and explain how you know it is linear.

Answers will vary.

15. Feivel thinks a table represents a linear function because there is a pattern in the change in outputs. Does his reasoning make sense? Why or why not?

Feivel is incorrect. The table could be linear or it could be non-linear since we don't know what the pattern is. If the pattern is a constant rate of change, it would be linear. If the pattern were adding two, then four, then six while the input only changes by one, it would be non-linear.

16. Pesha thinks the equation $y = \sqrt{x}$ is a linear function because there is no exponent. Do you agree with her? Why or why not?

Pesha is incorrect because the equation cannot be put in the form $y = mx + b$.