




Objective: Comparing Linear, Quadratic, and Exponential Models

Homework QF-11 – NYA p.600 #2 – 12 (even), 16

Do Now: Solve using a calculator. 1. $2x^2 - x = -8$ 2. $x^2 - 3x - 14 = 0$

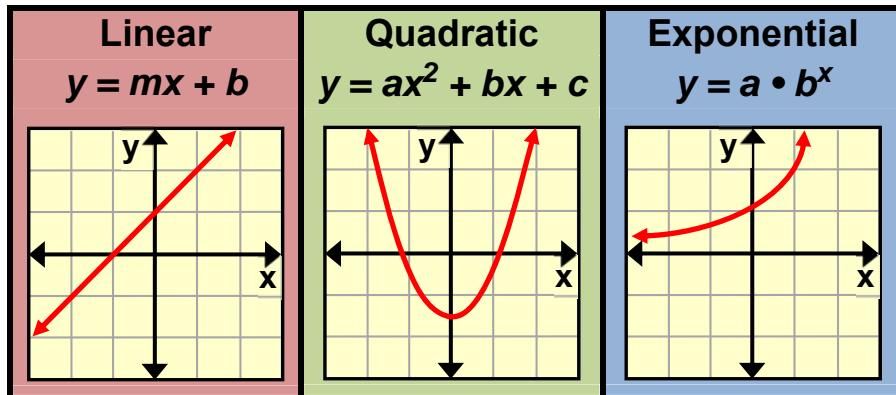
Exam Prep: Which of the following has no real number solutions?

- A) $3x^2 - 5x + 1 = 0$ B) $3x^2 - 5x + 4 = 0$ C) $-3x^2 - 11x + 4 = 0$ D) $-2x^2 - 3x + 1 = 0$

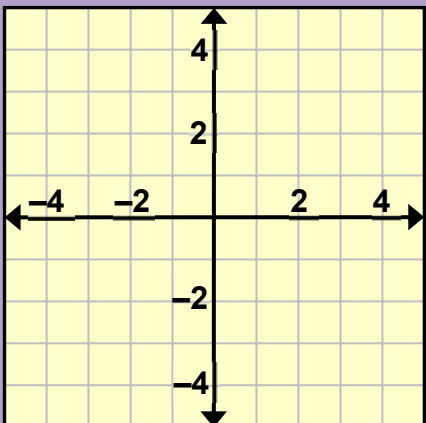
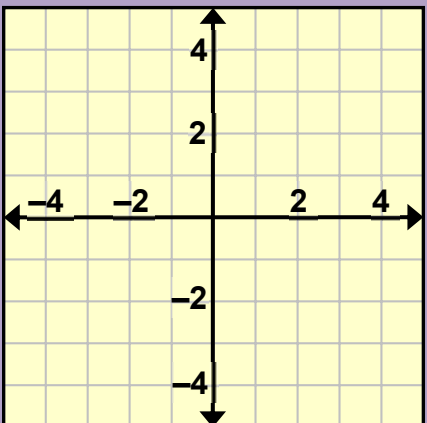
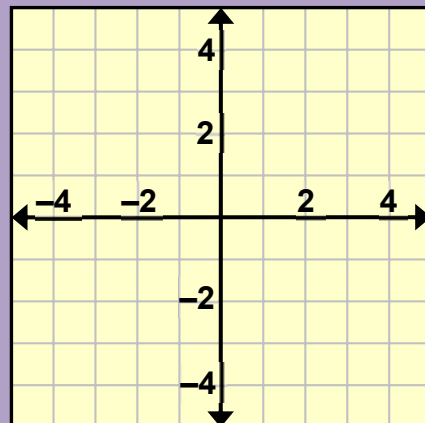


The journey comes to an end...
You REALLY need a TI graphing calculator.

You can use linear, quadratic, or exponential functions to model some sets of data. Here are the standard forms with examples of their graphs.



Graph each set of points. Which model is most appropriate for each set?

<p>A) $(-3, 5), (-2, 1), (0, -3)$ $(3, 5), (1, -2), (2, 1)$</p> <div style="text-align: center;">  </div> <p>Model:</p>	<p>B) $(1, 1), (-2, 5), (0, 2),$ $(-1, 3), (2, 1), (4, 0.5)$</p> <div style="text-align: center;">  </div> <p>Model:</p>	<p>C) $(-3, 4), (0.5, -3), (-2, 2),$ $(0, -2), (-1, 0), (1, -4)$</p> <div style="text-align: center;">  </div> <p>Model:</p>
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Practice: Linear, Exponential, or Quadratic

$(-1, 5), (2, -1), (0, -1), (3, 5), (1, -3)$

$(-1, 2), (-2, 8), (-3, 32), (0, 1/2), (1, 1/8)$

$(-3, 5), (0, -1), (2, -5), (-4, 7), (1, -3)$

Key Idea: Analyze Tables

Differences and Ratios of Functions

Linear Function: $y = 2x + 5$

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

$+1 \quad +1 \quad +1 \quad +1$
 $+2 \quad +2 \quad +2 \quad +2$

The y-values have a common *difference* of 2.

Exponential Function: $y = 4(2)^x$

x	-2	-1	0	1	2
y	1	2	4	8	16

$+1 \quad +1 \quad +1 \quad +1$
 $\times 2 \quad \times 2 \quad \times 2 \quad \times 2$

The y-values have a common *ratio* of 2.

Quadratic Function: $y = x^2 + 2x - 1$

x	-2	-1	0	1	2
y	-1	-2	-1	2	7

$+1 \quad +1 \quad +1 \quad +1$

$-1 \quad +1 \quad +3 \quad +5$

$+2 \quad +2 \quad +2$

First differences

Second differences

For quadratic functions, the second differences are constant.

Graph Practice

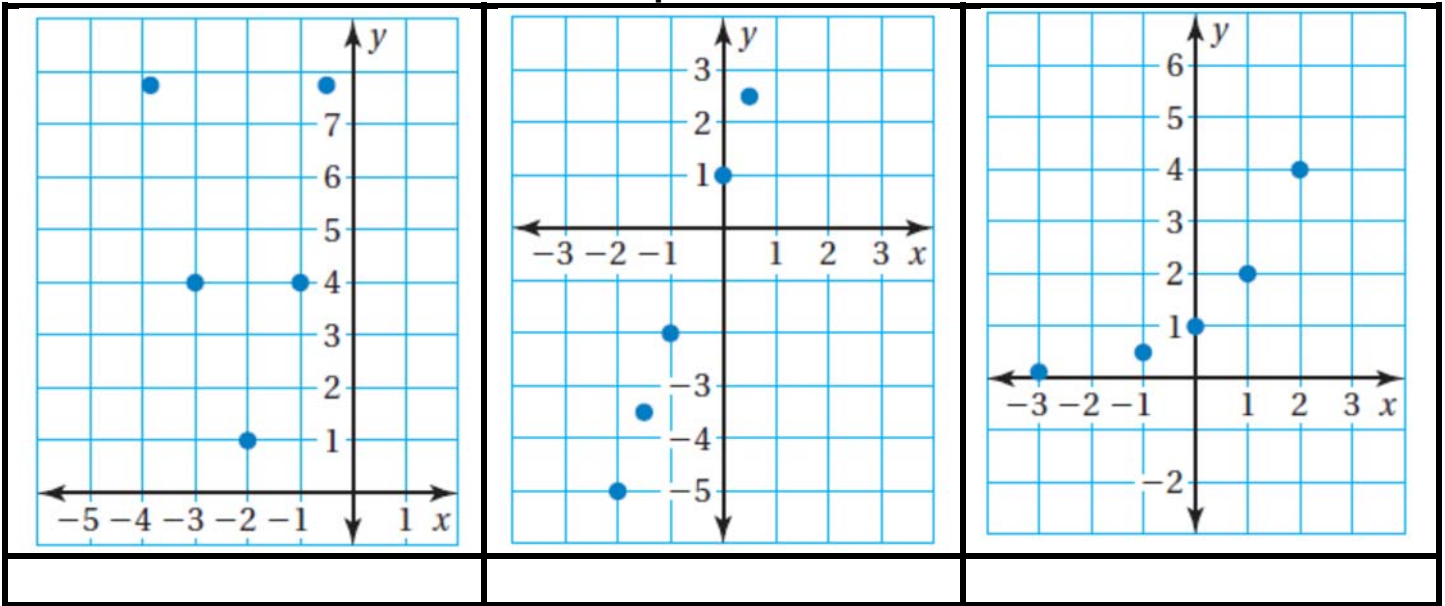


Table Practice

x	-2	-1	0	1	2
y	0	0.5	1	1.5	2

x	-1	0	1	2	3
y	0.2	1	5	25	125

x	-2	-1	0	1	2
y	0.75	1.5	3	6	12

x	2	3	4	5	6
y	2	4.5	8	12.5	18