

Assignment

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Course: CCSS Algebra I

Description

15. Exponential functions and equations

Assessments | Guided assessment

1 2 3 4 5 6 7 8 9 10 11

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Which of the following statements are true of an exponential function? Select all that apply.

- A. In an exponential function, there is a common multiplier.
- B. As the y -value increases by some constant value, the x -value is multiplied by a constant value.
- C. Repeated multiplication produces exponential data.
- D. The graph of an exponential function is a curve.
- E. Exponential functions have a constant rate of change.

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Drag tiles to the correct slots to complete each statement.

The rule for an exponential function is A . The variable a indicates the B of the graph. The variable b is the C . The D is an asymptote for the graph of an exponential function.

Tiles:Tile1 $f(x) = b + mx$ Tile2 $f(x) = a \cdot b^x$ Tile3 y -interceptTile4 x -intercept

Tile5 rate of change

Tile6 common multiplier

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Consider the change in population of two high schools: King High School and Kennedy High School. In 2005, each high school had 2000 students. The school district administration predicted that King High School would grow by 2% every year. The administration predicted that Kennedy High School's enrollment would decline by 3% each year. Let 0 represent the year 2005. What are the independent and dependent variables in this situation?

- | | |
|---|--|
| <p>A. x = number of students (independent)
y = number of years since 2005 (dependent)</p> <p>B. x = number of years since 2005 (independent)
y = number of students (dependent)</p> | <p>C. x = number of years the school has been open (independent)
y = number of students (dependent)</p> <p>D. x = number of graduating students each year (independent)
y = number of years since 2005 (dependent)</p> |
|---|--|

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You have defined the variables. Now you can establish a function rule. Drag the tiles to display the format of a function rule to predict the enrollment at each school.

$A = B \cdot C^D$

Tiles:

Tile1 growth rate

Tile2 number of
years since 2005

Tile3 total number
of students

Tile4 original number
of students

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Recall that the school district administration anticipated a 2% annual growth rate at King High School. The school had 2000 students in 2005. Given this information, which function rule describes the enrollment at King High School?

A. $y = 2000 \cdot 2^x$

C. $y = 2000 \cdot 1.02^x$

B. $y = 2000 \cdot 0.02^x$

D. $y = 2000 \cdot 0.98^x$

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You have established a function rule. Now complete this table for the predicted enrollment at King High School. Remember, 0 represents the year 2005, when there were 2000 students. The enrollments are rounded to the nearest student. Drag each tile to the correct slot.

Years	Process	Predicted enrollment
2005	<input type="text" value="A"/>	<input type="text" value="B"/>
2006	<input type="text" value="C"/>	<input type="text" value="D"/>
2007	$2000 \cdot 1.02^2$	2081
2008	$2000 \cdot 1.02^3$	2122
2009	$2000 \cdot 1.02^4$	<input type="text" value="E"/>
2010	$2000 \cdot 1.02^5$	2208
2015	$2000 \cdot 1.02^{10}$	2438

Tiles:

Tile1 2000

Tile2 2040

Tile3 2122

Tile4 2165

Tile5 $2000 \cdot 1.02^0$

Tile6 $2000 \cdot 1.02^1$

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Recall that the school district administration anticipated a 3% annual decline in enrollment at Kennedy High School. The school had 2000 students in 2005. Given the above information, which function rule describes the enrollment at Kennedy High School?

A. $y = 2000 \cdot 3^x$

C. $y = 2000 \cdot 1.003^x$

B. $y = 2000 \cdot 0.003^x$

D. $y = 2000 \cdot 0.97^x$

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Now that you have established a function rule, complete this table for the predicted enrollment at Kennedy High School. Remember, 0 represents the year 2005, when there were 2000 students. Round the enrollments to the nearest student.

Years	Predicted enrollment
2005	<u> </u> A
2006	<u> </u> B
2007	<u> </u> C
2008	<u> </u> D
2009	<u> </u> E
2010	<u> </u> F
2015	<u> </u> G

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Plan the graph of enrollment predictions. Use your function rules and tables. Drag tiles to complete the statements about the graph.

You have determined that the independent variable is the number of years since 2005. An appropriate scale for the horizontal axis is

A .

The dependent variable is the predicted enrollment for each year. The vertical axis should start at B and go past

 C .

The scale should increase by D at each mark.

Tiles:

Tile1 10

Tile2 200

Tile3 0

Tile4 2500

Tile5 2 years

Tile6 10 years

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If the predicted model holds true, how many students will be attending King High School in 2013?

A. 2,343

C. 2,013

B. 8,600

D. 16,320

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If the predicted model holds true, in what year will there be 1400 students at Kennedy High School?

A. 2007

C. 2016

B. Never

D. 2017