

Graphing Exponential Functions

Algebra 1 • Section 11.1

Name: _____

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Quick Review and Helpful Hints

Exponential models multiply by a constant factor over equal input intervals. Compare the initial value, multiplier, and long-term behavior before deciding what the model means.

Q Example: Evaluate $100(1.05)^2$.

Work: Square the growth factor: $1.05^2 = 1.1025$. Then multiply: $100(1.1025) = 110.25$.

Answer: 110.25

Practice Problems

Solve each problem. Show enough work that another student could follow your thinking.

- | | | | |
|---|-------|---|-------|
| 1. Evaluate 2^x at $x = 5$. | _____ | 6. Describe $y = 2^x + 4$. | _____ |
| 2. Find the initial value of $y = 4(3)^x$. | _____ | 7. Describe $y = 3(2)^x$ compared with $y = 2^x$. | _____ |
| 3. Is $y = 7(0.5)^x$ growth or decay? | _____ | 8. Find y when $x = -1$ for $y = 10(2)^x$. | _____ |
| 4. Find y when $x = 2$ for $y = 5(2)^x$. | _____ | 9. Which point is on $y = 2^x$: $(3, 8)$ or $(3, 6)$? | _____ |
| 5. Find the horizontal asymptote of $y = 3^x$. | _____ | 10. Find the multiplier in $y = 6(1.25)^x$. | _____ |

Word Problems

11. A rumor triples each hour from 4 people. Write the model. _____
12. A sample halves every day from 160 grams. Write the model. _____



Answer Keys

1. 32

2. 4

3. Decay

4. 20

5. $y = 0$

6. Shift up 4

7. Vertical stretch by 3

8. 5

9. $(3, 8)$

10. 1.25

11. $4 \cdot 3^h$

12. $160(0.5)^d$

Step-by-Step Explanations

1. $2^5 = 32$.

2. At $x = 0$, $3^0 = 1$, so the output is 4.

3. The base is between 0 and 1.

4. $5(2^2) = 5(4) = 20$.

5. The parent exponential approaches the x -axis but does not cross it.

6. Adding 4 outside the exponential moves the graph upward.

7. The output is multiplied by 3.

8. $2^{-1} = \frac{1}{2}$, so $10 \cdot \frac{1}{2} = 5$.

9. Since $2^3 = 8$, the matching point is $(3, 8)$.

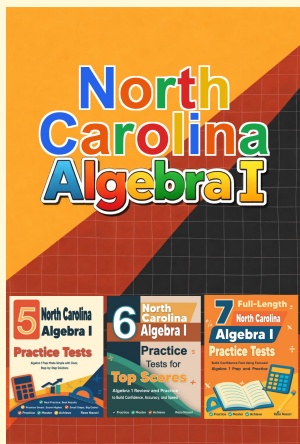
10. The base of the exponential is the repeated multiplier.

11. The initial amount is 4, and tripling gives multiplier 3.

12. Halving means multiplying by 0.5 each day.



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