Interpreting Functions and Parameters

Name: _____	Date: _____	Score: _____ / 24

Quick Review

In an exponential model $y = a \cdot b^t$ or $y = a(1 + r)^t$, each parameter has a real-world meaning. a is the **initial value** (output at $t = 0$). b **(or** $1 + r$**)** is the **growth factor** per time period — the multiplier. r is the **growth/decay rate** as a decimal: positive for growth, negative for decay. If $b > 1$, growing; if $0 < b < 1$, decaying. In a linear model $y = mx + b$: m is the rate of change per unit, b is the starting value. In a quadratic, the vertex gives max/min and the zeros give boundary times (when does the object hit the ground? when does profit hit zero?). Always connect each parameter to what it represents in the situation.

PRACTICE

Interpret each model.

1. A plant population is modeled by $y = 200(1.05)^t$. What does 200 represent? _____

2. For $y = 200(1.05)^t$, what is the percent growth rate? _____

3. A machine's value is modeled by $y = 500(0.8)^t$. Is this growth or decay? _____

4. For $y = 500(0.8)^t$, what is the percent decay rate? _____

5. A bacteria model is $y = 100 \cdot 2^t$. What is the multiplier each step? _____

6. The value of equipment is $V(t) = 2500(1.04)^t$. What is the annual rate? _____

7. In a linear cost model $y = mx + b$, what does m represent? _____

8. In a linear cost model $y = mx + b$, what does b represent? _____

9. A revenue model is a downward-opening parabola. What does its vertex represent? _____

10. In the height model $h(t) = -16t^2 + v_0t + h_0$, what does a zero of the function represent? _____

11. A laptop loses 10% of its value each year. What multiplier should an exponential model use? _____

12. A linear model has slope -2. What does that mean in context? _____

13. A town starts with 500 people and has multiplier 1.10 each year. What is the growth rate? _____

14. An account is modeled by $P(t) = 1000(1.025)^t$. Interpret the rate. _____

15. Does $y = a(1 + r)^t$ always model growth? _____

16. A medicine has a half-life of 5 hours. What does that mean? _____

17. A population has a doubling time of 3 years. What does that mean? _____

18. For $y = 80(0.5)^{t/3}$, what is the half-life? _____

19. What is the initial value of $y = 4 \cdot 3^t$? _____

20. If a population shrinks 8% per year, what multiplier is used? _____

♦ Word Problems

21. The model $P = 5000(1.03)^t$ describes a town's population t years after a census. Interpret the initial value and the growth factor.

_____

22. A drug's amount in the body is modeled by $A = 100(0.85)^t$ where t is hours. What's the hourly decay rate?

_____

23. A company's profit model is $P(x) = -x^2 + 20x - 50$ in thousands of dollars, where x is thousands of units sold. Interpret the vertex in the business context.

_____

Scan Me

24. A launched object's height is modeled by $h(t) = -16t^2 + 48t + 5$, with height in feet and time in seconds. Interpret each coefficient.

_____

Answer Keys

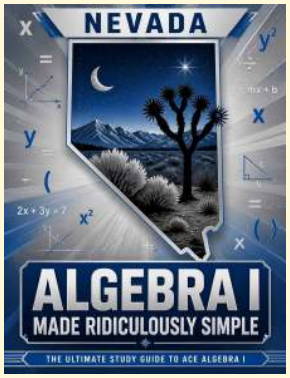
1. 200
2. 5%
3. decay
4. 20% decay
5. 2
6. 4%
7. rate of change
8. initial value
9. maximum revenue
10. landing time
11. 0.9
12. decreases by 2 per unit
13. 10% growth
14. 2.5% growth per year
15. only if $r > 0$
16. half remains every 5 hours
17. doubles every 3 years
18. 3
19. 4
20. 0.92
21. 5000 initial, 3% yearly growth
22. 15%
23. max profit at $x = 10$ thousand units, $P = 50$
24. initial height 5, initial velocity 48, gravity coefficient -16

Step-by-Step Tutor Notes

1. The 200 is the initial value, so the model starts with 200 plants when $t = 0$.
2. The multiplier is $1.05 = 1 + 0.05$, so the rate is 5% growth per time period.
3. This is a good place to slow down, check the notation, and simplify cleanly. The multiplier 0.8 is less than 1, so the value decreases each period. So the answer is decay.
4. The model keeps 80% each period, so it loses $1 - 0.8 = 0.20$, or 20%.
5. The base 2 means the amount is multiplied by 2 each time period, so it doubles.
6. The multiplier is $1.04 = 1 + 0.04$, so the model grows by 4% per year.
7. The slope m tells how much the output changes for each 1-unit increase in the input.
8. Focus on the main idea of the problem, then simplify carefully. The intercept b is the output when $x = 0$, so it is the starting value. So the answer is initial value.
9. A downward-opening parabola reaches its highest point at the vertex, so the vertex gives the maximum revenue.
10. Look for the key feature the question asks about, such as a zero, intercept, or vertex. A zero occurs when $h(t) = 0$, meaning the object's height is ground level. That leads to landing time.
11. Take it one clear step at a time and keep the original question in mind. Losing 10% leaves 90% of the value, so the multiplier is 0.90. So the answer is 0.9.
12. A negative slope means the output falls. Here it drops by 2 units for each 1-unit increase in the input.
13. Read the table by matching the correct row and column first, then use the count or total that fits the question. The multiplier is $1.10 = 1 + 0.10$, so the rate is 10% growth. This gives 10% growth.
14. The multiplier 1.025 is $1 + 0.025$, so the account grows by 2.5% each year.
15. If $r > 0$, the multiplier is greater than 1 and the model grows. If $r < 0$, the multiplier is less than 1 and the model decays.
16. Start with the definition the problem is testing, then apply it directly. Every 5 hours, the amount is multiplied by $\frac{1}{2}$. So the answer is half remains every 5 hours.
17. Take it one clear step at a time and keep the original question in mind. Every 3 years, the population is multiplied by 2. So the answer is doubles every 3 years.
18. The exponent becomes 1 when $t = 3$, so the amount is multiplied by 0.5 every 3 time units.
19. Take it one clear step at a time and keep the original question in mind. At $t = 0$, $3^0 = 1$, so $y = 4$. The starting value is 4. So the answer is 4.
20. Shrinking 8% means 92% remains each year, so the multiplier is $1 - 0.08 = 0.92$.
21. Use the labels on the display first; they tell you which count or total belongs in the answer. 5000: starting population. Multiplier 1.03 per year means 3% annual growth. This gives 5000 initial, 3% yearly growth.
22. Name the quantities first so the model is easy to read. Multiplier 0.85 means losing 15% each hour.
23. Look for the key feature the question asks about, such as a zero, intercept, or vertex. Vertex at $x = 10$, $P = 50$. Maximum profit of \$50K when selling 10 thousand units. That leads to max profit at $x = 10$ thousand units, $P = 50$.
24. 5: starting height. 48: initial upward velocity (ft/sec). -16: half of gravity's acceleration (in ft/sec^2).

Scan Me

Want a Full Algebra 1 Textbook? Try Our Nevada SBAC Made Simple Book!



Nevada SBAC Algebra I Made Ridiculously Simple

The friendly, step-by-step Algebra 1 textbook
Plain-English explanations, guided practice, and review support.

Scan Me

Full Lessons Inside

Concepts
Practice
Mastery

Important: All our test books contain **unique, completely different tests** from each other! Each book offers fresh practice questions—no repeats!

5 Practice Tests

- ✓ 5 complete practice tests with detailed explanations
- ✓ Perfect foundation for SBAC test preparation
- ✓ Builds confidence and test-taking skills
- ✓ High-quality questions aligned with state standards

Start your practice journey!

6 Practice Tests

- ✓ 6 complete practice tests with detailed explanations
- ✓ **Unique tests**—different from the 5 tests book
- ✓ Perfect for more practice after mastering 5 tests
- ✓ Builds even more confidence and test-taking skills
- ✓ Same high-quality questions aligned with standards

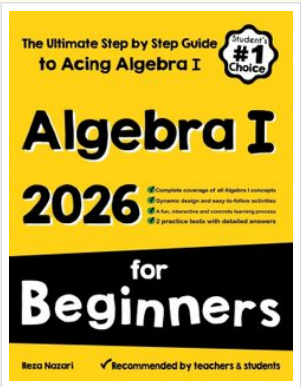
Take your practice to the next level!

7 Practice Tests

- ✓ 7 complete practice tests for maximum preparation
- ✓ **Unique tests**—different from 5 and 6 tests books
- ✓ The most comprehensive practice for Algebra 1
- ✓ Ideal for students aiming for top scores
- ✓ Extensive practice builds mastery and confidence

Go all the way with comprehensive practice!

☐ STUDENT FAVORITE • Master Algebra I From the Ground Up ☐



Algebra I for Beginners

Written by a top math teacher & aligned with national and state Algebra I courses. From linear equations to graphing quadratics — explained the easy way.

- ✓ **Complete coverage** of every Algebra I concept — perfect companion to these worksheets
- ✓ **Step-by-step explanations** with worked examples on every topic
- ✓ **QR codes in every chapter** for free video lessons & bonus practice
- ✓ **2 full-length practice tests** with detailed answer keys

✓ 100% Guaranteed
✓ Lifetime Support
✓ Trusted by Teachers

⋆ STUDENT'S #1 CHOICE ⋆

Teacher-recommended • 12,000+ Happy Students

Start Your Algebra Journey Today! →

↓PDF EDITION

Scan Me

Instant download • any device

☐ PAPERBACK

Scan Me

Paperback on Amazon

Hold it in your hands

Pair these free worksheets with *Algebra I for Beginners* and you have a complete self-paced course — concept lessons, daily practice, and full exam-style reviews, all in one path. →
EffortlessMath.com/product/algebra-i-for-beginners