

Algebra 1 - Exponential Functions and Growth - Test

Common Core F-LE.A.1, F-LE.A.2, F-LE.A.3, F-IF.C.7e, F-IF.C.8b · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

This 45-minute test on exponential functions and growth covers Common Core F-LE.A.1, F-LE.A.2, F-LE.A.3, and F-IF.C.8b and is worth 20 points. Work alone, show all steps, and use a calculator only if your teacher allows it. Partial credit is given for correct work, so write down your reasoning even when you are unsure of the final answer.

About this test

- Grade: Algebra 1
- Chapter: Exponential Functions and Growth
- Standards: F-LE.A.1, F-LE.A.2, F-LE.A.3, F-IF.C.7e, F-IF.C.8b
- Time: 45 minutes
- Total: 20 points

Question 1 - Growth or decay [2 pts]

State whether each function models growth or decay and give the percent change per step.

a. $y = 4(1.3)^x$ (1 point)

b. $y = 7(0.6)^x$ (1 point)

Question 2 - Evaluate [2 pts]

Let $f(x) = 5 \cdot 2^x$. Find $f(4)$ and $f(-1)$.

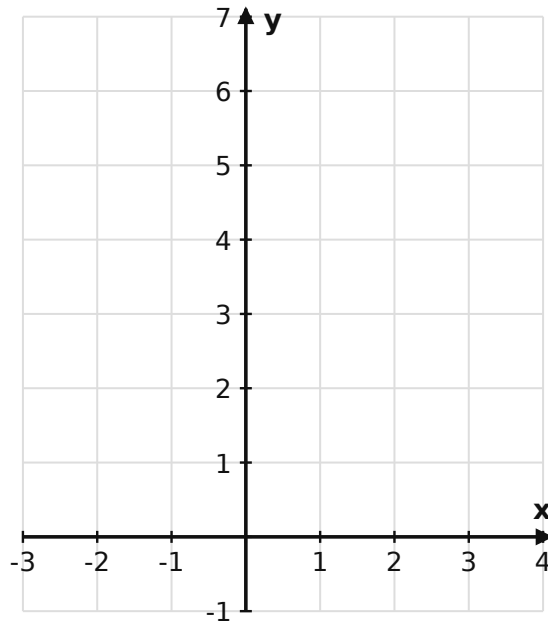
Question 3 - Write from a table [2 pts]

x	0	1	2	3
y	3	6	12	24

Table for question 3.

The table shows an exponential function. Write its equation.

Question 4 - Graph a decay function [2 pts]



Grid for question 4.

Graph $y = 3\left(\frac{1}{2}\right)^x$ by plotting the points for $x = -1, 0, 1, 2$.

Question 5 - Savings growth [2 pts]

A savings account has \$500 and earns 8% per year, compounded annually.

- Write a function for the amount after t years. (1 point)
- Find the amount after 3 years, to the nearest cent. (1 point)

Question 6 - Solve [2 pts]

Solve each equation.

- $5^x = 125$ (1 point)
- $2^{x+1} = 16$ (1 point)

Question 7 - Car depreciation [3 pts]

A car's value in dollars is $V = 30000(0.9)^t$ after t years.

- What percent does the car lose each year? (1 point)
- Find the value after 4 years. (1 point)
- In which year does the value first drop below \$20,000? (1 point)

Question 8 - Linear versus exponential [3 pts]

Week	0	1	2	3	4	5	6
Plan A	100	150	200	250	300	350	400
Plan B	10	20	40	80	160	320	640

Two savings plans.

Plan A saves \$100 and adds \$50 each week. Plan B saves \$10 and doubles each week. The table shows the amounts.

- Which plan has more money in week 5? (1 point)
- Which plan has more money in week 6? (1 point)
- Explain why Plan B eventually stays ahead. (1 point)

Question 9 - Half-life [2 pts]

A 120 mg dose has a half-life of 4 hours. Write a function for the amount after t hours and find the amount after 12 hours.