

Exponential Functions: math test, Grade 11 – download the PDF

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Classify and evaluate

/ 3 pts

a. (1 pt) Classify each function as growth or decay and give the percent rate:

$$y = 2.5(1.04)^x \text{ and } y = 90(0.95)^x.$$

b. (2 pts) For $f(x) = 4\left(\frac{3}{2}\right)^x$, compute $f(0)$, $f(2)$ and $f(-1)$.

2 Transformations and graph

/ 4 pts

Let $g(x) = 2^{x+1} - 3$.

a. (1 pt) Describe how to get its graph from $y = 2^x$.

b. (1 pt) Give the horizontal asymptote and the range.

c. (1 pt) Find the y-intercept.

d. (1 pt) Complete a table for $x = -3, -2, -1, 0, 1$ and sketch the curve.

3 Equation from two points

/ 3 pts

An exponential function $f(x) = a \cdot b^x$ passes through $(1, 12)$ and $(3, 108)$. Find the formula, then compute $f(4)$.

4 Compound interest (calculator allowed)

/ 4 pts

Maria deposits 3,500 dollars at 3.2% for 5 years. (a) Find the balance if interest is compounded quarterly. (b) Find the balance if it is compounded continuously. (c) How much more does continuous compounding earn?

5 A laptop loses value

/ 3 pts

A laptop costs 1,200 dollars and loses 25% of its value each year. (a) Write $V(t)$. (b) Find $V(2)$. (c) In which whole year does its value first fall below 600 dollars?

6 Linking e and money

/ 3 pts

(a) Compute $(1.01)^{100}$ to 4 decimal places and compare with e . (b) Find the value of 600 dollars invested for 8 years at 5% compounded continuously.



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