

F.IF.C.8: Graphing Exponential Functions

1 Which function represents exponential decay?

1) $y = 2^{0.3t}$

3) $y = \left(\frac{1}{2}\right)^{-t}$

2) $y = 1.2^{3t}$

4) $y = 5^{-t}$

2 Which function represents exponential decay?

1) $p(x) = \left(\frac{1}{4}\right)^{-x}$

3) $r(x) = 2.3^{2x}$

2) $q(x) = 1.8^{-x}$

4) $s(x) = 4^{\frac{x}{2}}$

3 Which statement is true about the graph of $f(x) = \left(\frac{1}{8}\right)^x$?

1) The graph is always increasing.

2) The graph is always decreasing.

3) The graph passes through $(1, 0)$.

4) The graph has an asymptote, $x = 0$.

4 The population of bacteria, $P(t)$, in hundreds, after t hours can be modeled by the function $P(t) = 37e^{0.0532t}$. Determine whether the population is increasing or decreasing over time. Explain your reasoning.

5 The function $M(t)$ represents the mass of radium over time, t , in years.

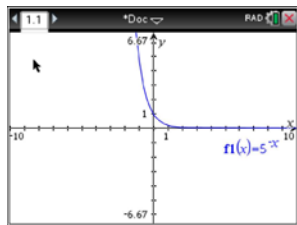
$$M(t) = 100e^{\frac{\left(\ln \frac{1}{2}\right)t}{1590}}$$

Determine if the function $M(t)$ represents growth or decay. Explain your reasoning.

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Answer Section

1 ANS: 4



$$y = 5^{-t} = \left(\frac{1}{5}\right)^t$$

REF: 061615aai

2 ANS: 2

$$p(x) = 4^x, q(x) = \left(\frac{5}{9}\right)^x, r(x) = 5.29^x, s(x) = 2^x$$

REF: 012304aai

3 ANS: 2

REF: 061802aai

4 ANS:

$e^{0.0532} > 1$, so $P(t)$ is increasing.

REF: 062327aai

5 ANS:

$$0 < e^{\frac{\ln \frac{1}{2}}{1590}} < 1, \text{ so } M(t) \text{ represents decay.}$$

REF: 011728aai