C_18 Chapter 7 in-class review

Tuesday, November 16, 2021 10:08 AM

C_16 Chapter 7 In-class Review

Chapter 7 In-class Group Review

1. Label each of the following as either ***exponential growth*** or ***exponential decay***.

a) $y = 4^{-x}$ b) $y = 3(7)^{5x}$ c) $y = -3(0.8)^{x-5}$ d) $y = \left(\frac{9}{2}\right)^{3x}$

2. Write the equation of the function that results from the set of transformations given: $y = 4^x$ is expanded vertically by a factor of 6, translated 5 units down, horizontally expanded by a factor of 8, translated 3 units right, and reflected across the x-axis.

3. The function $M = M_0(0.85)^{\frac{h}{2}}$ represents how long a drug lasts in the body where M is the mass remaining in the body after h hours and M_0 is the mass of the dose taken.
a) How much of the drug will remain in the body after 24 hours if a person takes 250 mg of the drug? Give answer correct to 2 decimal places.

b) If a person takes a dose of 200 mg of this drug, how long will it be until only 5 mg remains in the body? Find answer correct to 2 decimal places.

4. Solve algebraically using the common base method: $25^{2x-1} = 625^{1-x}$

5. Write equations to model each situation below:
a) A population of robins has an initial population of 350, and is increasing by 12% every 2 years. Write the exponential equation that gives the population of robins, R, after t years.

b) A radioactive sample with an initial mass of 300 mg has a half-life of 42 days. Write the exponential equation that gives the mass, M, after t days.

6. Determine the range of the function $y = 3^{x-5} + 7$.

7. Describe the behavior of the function $y = 6^x$.

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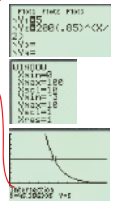
decay growth decay growth

$y = -6\left(4^{\frac{1}{8}(x-3)}\right) - 5$

$M = 250(0.85)^{\frac{24}{2}}$
$= 35.56$ mg

$5 = 200(0.85)^{h/2}$
Solve graphically
45.40 hours

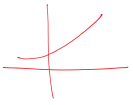


$(5^2)^{2x-1} = (5^1)^{1-x}$
$5^{4x-2} = 5^{1-4x}$
$\Rightarrow 4x - 2 = 1 - 4x$
$8x = 6$
$x = \frac{6}{8} = \frac{3}{4}$

$R = 350(1.12)^{t/2}$

$M = 300(0.5)^{t/42}$

$\{y \mid y > 7, y \in \mathbb{R}\}$



- increasing
- asymptote $y = 0$
- y-intercept $(0,1)$
- domain $\{x \mid x \in \mathbb{R}\}$
- range $\{y \mid y > 0, y \in \mathbb{R}\}$