Bellwork Alg 2 Monday, February 4, 2019

You will not be allowed to use a calculator on problems 1 to 3 on the quiz.

1. Match each graph with its equation

i. $y = 3(2)^x$ ii. $y = 6(0.3)^x$ iii. $y = 3(7)^x$ iv. $y = 6(0.72)^x$ v. $y = 6(4)^x$

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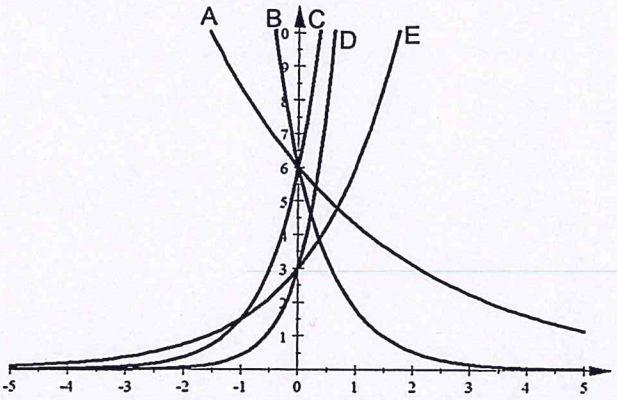

2. Rewrite into exponential form. a) $\log_x 11 = 3$ b) $\log x = 6$

3. Rewrite into logarithmic form. $9^x = 150$

4. State the percent change this exponential equation represents: $y = 346(0.8012)^x$

5. A situation has a 7.06% increase each year. State the base that would be used in the exponential equation.

6. Solve. Round to the nearest hundredth. $2(8)^{2x+1} - 3 = 44$

7. The half-life of a certain medicine is 55 minutes. If a 400 mg dose is administered at 9:10 am find the amount remaining at 2:45 pm to the nearest hundredth.

8. The population of a city has been decreasing 2.31% each year. The population in 2011 was 140,000.

a) Find the population in 2005.

b) In how many years will the population reach 75,000? Round to the nearest hundredth.

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ANSWERS

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i. $y = 3(2)^x$ ii. $y = 6(0.3)^x$ iii. $y = 3(7)^x$ iv. $y = 6(0.72)^x$ v. $y = 6(4)^x$

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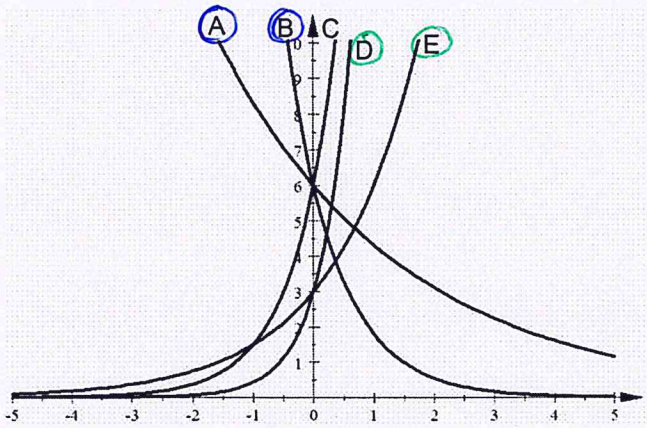

2. Rewrite into exponential form. a) $\log_x 11 = 3$ b) $\log x = 6$

$x^3 = 11$ $10^6 = x$

3. Rewrite into logarithmic form. $9^x = 150$

$\log_9 150 = x$

4. State the percent change this exponential equation represents: $y = 346(0.8012)^x$

19.88% decrease

0.8012 × 100 = 80.12%. 100% − 80.12% = 19.88%

5. A situation has a 7.06% increase each year. State the base that would be used in the exponential equation.

$b \Rightarrow$ $100 + 7.06 = 107.06\%$

$b = 1.0706$

6. Solve. Round to the nearest hundredth. $2(8)^{2x+1} - 3 = 44$

$+3 \quad +3$

$\frac{2(8)^{2x+1}}{2} = \frac{47}{2}$

$8^{2x+1} = 23.5$

$\log_8 23.5 = 2x+1$

$x = 0.26$

7. The half-life of a certain medicine is 55 minutes. If a 400 mg dose is administered at 9:10 am find the amount remaining at 2:45 pm to the nearest hundredth.

$y = 400(0.5)^{x}$

$= 400(0.5)^{335/55}$

x: $\frac{9:10\text{am to } 2:45\text{pm}}{55\text{min}} = \frac{335}{55}$

9:10 am — 2hr 50min — NOON — 2hr 45min — 2:45 pm

170 min + 165 min = 335 min

$y = 5.87$ mg

8. The population of a city has been decreasing 2.31% each year. The population in 2011 was 140,000.

a) Find the population in 2005.

b: $100 - 2.31 = 97.69\%$ $b = 0.9769$

x: $2005 - 2011 = -6$

$y = 140{,}000(0.9769)^{-6} = 161{,}075$

b) In how many years will the population reach 75,000? Round to the nearest hundredth.

$\frac{75{,}000}{140{,}000} = \frac{140{,}000}{140{,}000}(0.9769)^{x}$

$\frac{75}{140} = 0.9769^{x}$

$\log_{.9769}\left(\frac{75}{140}\right) = x$

$x = 26.71$ yrs