Advanced Algebra 2 **Quiz #7-1 Review Worksheet** Name: Key

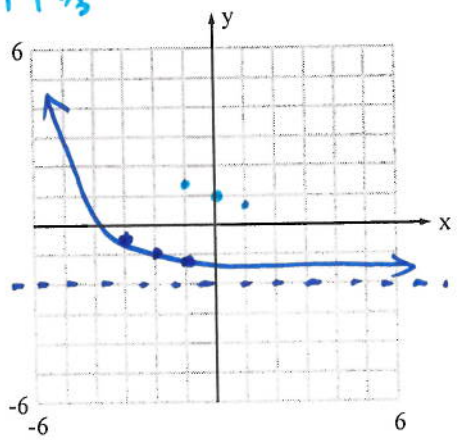
Part 1- NO Calculator

Graph each function. Show 3 basic points and their transformation points for each graph. State the domain and range for each function. Draw in any asymptotes.

1. $y=\left(\frac{3}{4}\right)^{x+2}-2$

$y=\left(\frac{3}{4}\right)^{x}$

x	y
0	1
1	3/4
-1	4/3

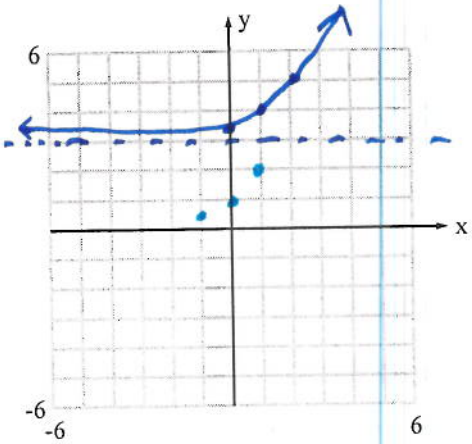


D: R R: $y>-2$

2. $y=2^{x-1}+3$

$y=2^{x}$

x	y
0	1
1	2
-1	1/2



D: R R: $y>3$

3. Given the model $y=150(1.23)^{t}$. Identify the initial amount, the growth factor, and the percent of increase.

Initial amount: 150 Growth factor: 1.23 Percent increase: 23%

Tell whether each function represents an exponential growth (EG) or exponential decay (ED).

4. $y=5(3)^{x}$ EG

5. $y=2\left(\frac{2}{3}\right)^{x}$ ED

6. $y=4e^{-5x}$ ED

Simplify each expression.

7. $\frac{e^{x}}{e^{-4x}}=e^{5x}$

8. $e^{4}\cdot e^{5}=e^{9}$

Simplify each expression.

9. $(4e^{-5})^2 = \frac{16}{e^{10}}$ or $16e^{-10}$

10. $\sqrt{20e^5} = 2e^2\sqrt{5e}$

Rewrite each logarithmic equation into exponential form.

11. $\log_3 243 = 5$

$3^5 = 243$

12. $\log_6 \frac{1}{216} = -3$

$6^{-3} = \frac{1}{216}$

Rewrite each exponential equation into logarithmic form.

13. $(-5)^3 = -125$

$\log_{-5} -125 = 3$

14. $\left(\frac{3}{2}\right)^4 = \frac{81}{16}$

$\log_{3/2} \frac{81}{16} = 4$

Evaluate each logarithm.

15. $\log_4 64 = x$

$4^x = 64$

$4^x = 4^3$

$x = 3$

16. $\log_3 \frac{1}{27} = x$

$3^x = \frac{1}{27}$

$3^x = 3^{-3}$

$x = -3$

Part 2 - Calculator Allowed

1. You buy a new truck for $45,000. The value decreases by 17% each year.

a) Write a model that gives the truck's value after t years. $y = 45000(.83)^t$

b) Find the value of the truck after 8 years. Round to the nearest dollar.

$10,135

c) Find when the value of the truck will be $20,000. Round to the nearest tenth.

use graph: zoom fit, trace $\approx$ 4.5 years

2. You deposit $850 in an account that pays 1.8%. How much money will be in the account after 5 years based on how often the money is compounded. SHOW SET UP.

a) quarterly — Set-up: $850\left(1+\frac{.018}{4}\right)^{4.5}$ — a) $929.86

4 times

b) monthly — Set-up: $850\left(1+\frac{.018}{12}\right)^{12.5}$ — b) $929.98 or $929.99 *not sure if bank rounds up or down

12 times

c) continuously — Set-up: $850 \cdot e^{.018 \cdot 5}$ — c) $930.05

$A = Pe^{rt}$

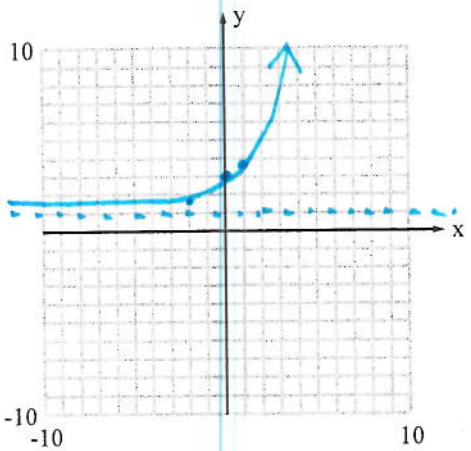
3. Find the value of $64e^{3.7}$. Round to 3 decimal places. 2588.627

4. Draw the graph of $y = 2e^{0.3x} + 1$ including the asymptote. State the domain and range. Name 3 points on your graph. Any rounded values should be to 3 places.

Domain: $\mathbb{R}$

Range: $y > 1$

Pts: (0, 3) (1, 3.7) (-1, 2.482)



5. The population (in thousands) of a city can be modeled by $P = 200e^{0.025t}$ where t is the number of years since 1995. What was the population in 2010?

$P = 200e^{.025 \cdot 15} \approx 290,998$ people

Use a calculator to evaluate the logarithm to two significant digits.

6. $\log 47 \approx 1.67$

7. $\ln 9.21 \approx 2.22$