Adv Algebra – Ch 8 and 9 Cumulative Review

Name_____ Period_____

For each of the following problems, ***show work or receive no credit.***

1.   A new car that sells for $25,000 depreciates 15% each year.

   a) Write a model for the value v of the car after t years.   1a. _____

   b) What is the value of the car after 10 years?   1b. _____

2.   If you deposit a principal amount of $1000 in an account that   2. _____
is compounded continuously at an annual rate of 3%, how
much money would you have after 20 years?

3.   Write an exponential function of the form $y = ab^x$ that contains   3. _____
the points $(-2, 16)$ and $\left(3, \dfrac{1}{2}\right)$.

4.   Write $\log_2 8 = 3$ in exponential form.   4. _____

5.   Write the following as a single logarithm: 5. _____
$2 \log_2 x - 3 \log_2 y + 5 \log_2 z$

6.   Expand the following logarithm: $\log \dfrac{z\sqrt[3]{y}}{x^2}$ 6. _____

7. Evaluate the following logarithm: $\log_3 \dfrac{1}{81}$

7. _____

For questions 8 – 11, solve the equation. Round to two decimal places if necessary.

8. $\log_6 16x = 5$

8. _____

9. $9^{2x-3} + 4 = 21$

9. _____

10. $3e^{x+1} - 2 = 10$

10. _____

11. $1 - 2 \ln x = -4$

11. _____

12. The pressure of a gas P, in atmospheres, varies inversely with the gas's volume V, in liters, and directly with the gas's temperature, T, in Kelvins. The gas has a pressure of 5 atmospheres if it has a volume of 20 liters and a temperature of 300 Kelvins.
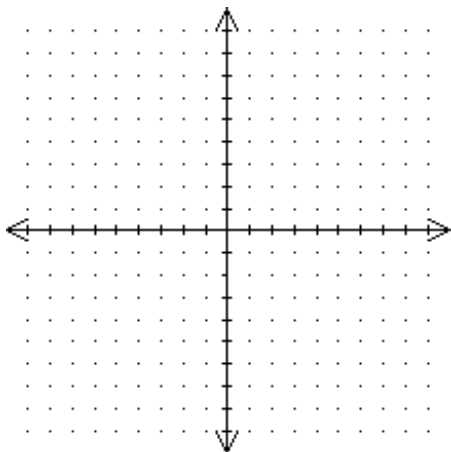
a) Write a model for this variation.

12a. _____

b) Find the pressure of the gas if it has a temperature of 450 Kelvins and a volume of 60 liters.

12b. _____

Graph each function. State the domain, range, and asymptote(s). Show at least three points and the asymptote(s) in the graph.
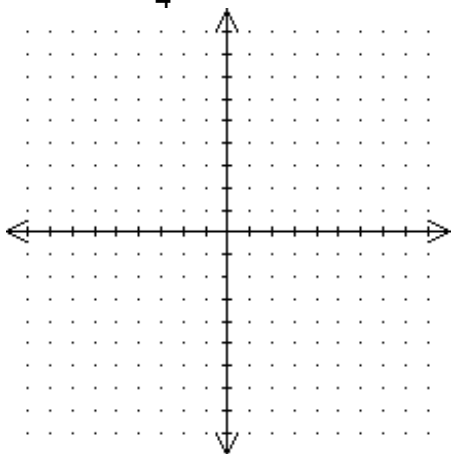
13. $y = \log_2(x + 2) - 1$

Domain: _____

Range: _____
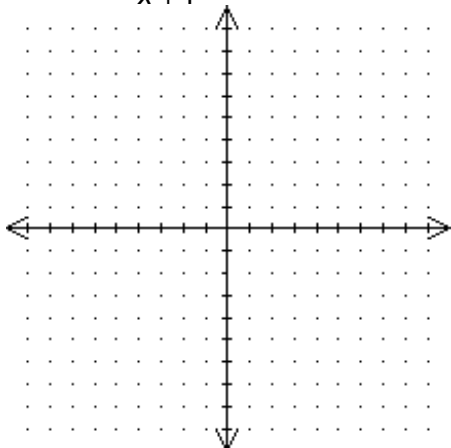
Asymptote: _____

14.
$$y = -\frac{1}{4}(2)^{x-1} + 2$$

Domain: _____

Range: _____

Asymptote: _____

15.
$$y = \frac{2}{x+1} - 2$$

Domain: _____

Range: _____

Horizontal asymptote: _____

Vertical asymptote: _____

For questions 16 – 17, solve the equations. Check each solution.

16. $\dfrac{3x}{x+1} + \dfrac{6}{2x} = \dfrac{7}{x}$

16. _____

17. $\dfrac{x}{2x+7} = \dfrac{x-5}{x-1}$

17. _____

18. Simplify $\dfrac{3x^2 + x - 2}{x^2 + 3x + 2} \div \dfrac{2x}{x+2}$. State any restrictions on the variable.

18. _____

Restrictions: _____

For questions 19 – 20, simplify completely.

19. $\dfrac{5x-1}{x^2+2x-8} - \dfrac{6}{x+4}$

19. _____

20. $\dfrac{\dfrac{2}{x}-4x}{\dfrac{4}{x^3}}$

20. _____