Algebra 1 Review BM 3

1. Simplify: $\sqrt[5]{6^4} \cdot \sqrt[5]{6^7}$

2.

Consider the equation that models the amount earned due to interest of an investment where

- A is the amount of money in the account in dollars,
- P is the starting investment in dollars,
- r is the rate of interest earned,
- t is the time in years,
- n is the number of times the interest is compounded per year.

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

Enter an equation for which the solution is the rate of interest given the amount in the account is \$2500, the starting investment is \$1000, over a time of 7 years, with interest compounding 4 times per year.

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3. The population of a small town has been decreasing by 8% each year. If the town currently has 12,500 residents and this rate continues, how many residents will the town have in 6 years? Round your answer to the nearest whole number.

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4. Determine whether each function represents exponential growth or decay.
   a) $y=150(1.12)^t$
   b) $P=800(0.93)^x$
   c) $A=45(2.5)^n$

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5. Determine whether each sequence is geometric or not geometric:
   a) 3, 6, 12, 24, 48,…
   b) 5, 10, 20, 35, 70,…
   c) 81, 27, 9, 3, 1,…
   d) 2, 5, 10, 17, 26,…

6. Consider the function $g(x) = 12(\frac{4}{3})^x$.

Find the y-intercept, the asymptote, the constant ratio, and the range.

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7. A movie theater plans to build a rectangular screen with a height that is 2 feet less than three times the width, in feet. Write an equation for the area, A, in square feet, of the screen in terms of the width, w, in feet.

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8. Find each product:

a) $(x - 7)(x + 2)$

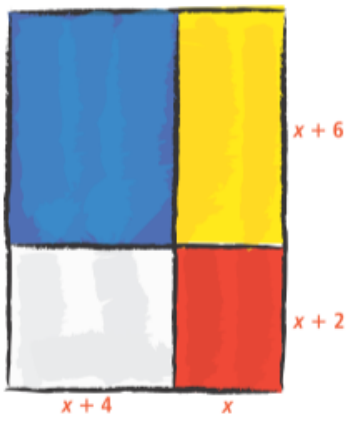
b) $(x - 5)^2$

c) $-3x(x^2 + 8x - 3)$

d) $(2x + 3)^2$

9.

Find the area and perimeter of the painting shown.



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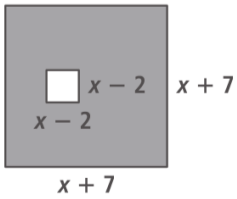
10. A hole is punched in a piece of metal to make a part for a machine. What is the area of the metal part, or the shaded region shown?



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11. Factor each polynomial.

a) $4x^2 - 49$

b) $x^2 + x - 42$

c) $4x^2 - 8x - 6$

d) $x^2 - 17x + 52$

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12. Find the difference $(4x^2 - 6x + 4) - (x^2 + x - 7)$

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13. Factor the polynomial by grouping. $6x^2 + 17x + 5$