

***“The best preparation for tomorrow is doing your best today.”*** – H. Jackson Brown, Jr.

- 1) Divide the following using synthetic division:  
 $(3x^3 + 12x^2 + 11x - 2) \div (x + 2)$
  
- 2) Divide the following using synthetic division:  
 $(3x^3 - 5x^2 + 2) \div (x - 2)$
  
- 3) When the polynomial  $p(x) = (x^3 + 2x^2 - 21x + b)$  is divided by the expression  $(x - 3)$  the quotient is  $(x^2 + 5x - 6)$ , what is the value of  $b$ ?
  
- 4) The area of a rectangle is represented by the expression  $(3x^3 - x^2 - 13x + 2)$ . If the length of the rectangle is represented by  $(x + 2)$ , what is the width?
  
- 5) The volume of a rectangular prism is represented by the expression  $(x^3 - 2x^2 - 20x - 24)$ . The width of the rectangular prism is represented by the expression  $(x - 6)$ . If the height and the length are the same, what is the height of the rectangular prism?

Solve the following:

1.  $3 \log_6 4 - \log_6 8 = \log_6 2x$
  
2.  $\log_4(10x + 14) = 3$
  
3.  $\log_7 6x = \log_7(3x + 15)$
  
4.  $\log_7 36 - \log_7 x^2 = \log_7 4$
  
5.  $\log_3 9 + \log_3 3x = 4$

Use the following function for problems 1 – 2.

$$f(x) \begin{cases} -5x - 4, & x < -3 \\ \frac{1}{2}x + 3, & -3 \leq x < 0 \\ 2x^2 - 4x, & 0 \leq x < 5 \\ 10x - 2x, & x \geq 5 \end{cases}$$

1. Evaluate:  $f(4)$

2. Evaluate  $2f(-2) + f(6)$

Use the following functions for questions 3 – 5

$$f(x) = 3x - 5$$

$$g(x) = 2x^2 + 3$$

$$h(x) = 4x - 7$$

3. Find:  $f(h(6))$

4. Find:  $f(h(g(1)))$

5. Find:  $f(g(x))$