



### Summer Assignment for Precalculus (M105)

*Evaluate each expression*

- $7 \times 2 - 5 - 3$
- $(-2) - ((-10) - 7) - 7$
- $(-6) + \frac{20 - 10}{2}$

*Evaluate each expression using the values given*

- $p - (9 + |9| - q)$ ; use  $p = 2$ , and  $q = 5$
- $|x| + |z + z|$ ; use  $x = 6$ , and  $z = -6$
- $-\frac{10a|b|}{4}$ ; use  $a = 8$ , and  $b = -4$

*Simplify each expression*

- $4(5 + 8r) + 8$
- $-6 - 4(2b - 3)$
- $7(6a - 5) + 7a(-2 - 4a)$
- $-2v(1 + 3v) - 3v(v + 3)$

11.  $-6x(-8x - 3) - (x - 2)$

12.  $2(7 + 6x) - 7(x + 2)$

*Solve the following equations for the unknown  $x$ :*

13.  $\frac{1}{2}(x - 3) + x = 17 + 3(4 - x)$

14.  $\frac{5}{x} = \frac{2}{x - 3}$

*Multiply the indicated polynomials and simplify.*

15.  $(x - 1)(x^2 + x + 1)$

16.  $(x^3 + 2x - 1)(x^3 - 5x^2 + 4)$

*Find the domain of each of the following functions.*

17.  $f(x) = \sqrt{1 + x}$

18.  $f(x) = \frac{1}{1 + x}$

19.  $f(x) = \frac{1}{\sqrt{1 + x}}$

20. Given that  $f(x) = x^2 - 3x + 4$ , find and simplify  $f(3)$ ,  $f(a)$ ,  $f(-t)$ , and  $f(x^2 + 1)$ .

*Factor the following quadratics.*

21.  $x^2 - 10x + 21$
22.  $-2x^2 + 7x + 15$

*Solve the following equations and inequalities.*

23.  $\sqrt{x^2 - 3} = \sqrt{2x}$
24.  $-2x + 4 \geq 3$
25.  $\frac{x+4}{x-3} = 2$
26.  $|x - 5| = 4$
27.  $x^2 - x - 2 > 0$
28.  $\sqrt{x} = \sqrt{2x - 1}$

*Add/Subtract the following rational expressions.*

29.  $\frac{x^2 + 1}{(x - 1)(x - 2)} - \frac{x^3}{x - 3}$
30.  $\frac{x}{x + 2} + \frac{3}{x - 4}$

*Simplify the rational expression if possible.*

31.  $\frac{x^2 + 5x + 6}{x^2 - 3x + 2}$
32.  $\frac{x^2 + x - 2}{x^2 - 1}$
33.  $\frac{\frac{x}{x+2} + 3}{\frac{x+1}{x-1}}$

*Solve the following quadratic equations in three ways: a) factor, b) quadratic formula, c) complete the square.*

34.  $-x^2 - 3x - 2 = 0$
35.  $2x^2 + 2x - 4 = 0$