MATH 118: Practice Midterm 1

Name: _____

Directions:

* Show your thought process (commonly said as ”show your work”) when solving each problem for full credit.
* If you do not know how to solve a problem, try your best and/or explain in English what you would do.
* Good luck!

Problem	Score	Points
1		10
2		10
3		10
4		10
5		10
6		10
7		10
8		10
9		10
		50

1. Short answer questions:

   (a) True or False: We are allowed to use exponent laws in the following way:

$$\left(\frac{x^3y^2}{z^3}\right)^2 = \frac{x^5y^4}{z^5}$$

   (b) True or false: We can simplify

$$\frac{(x+3)\left[x-2(x+1)\right]}{(x+3)^2}$$

   by crossing out the $x+3$.

   (c) True or false: If a is a real number, it is possible for $|a|$ to be negative.

2. Factor and simplify:

   (a) $8x^2 + 8x - 6$

   (b) $(x+3)^2(x-2) + (x+3)(x-2)^2$

3. Expand and simplify:

   (a) $(3x-1)(4x+5)-2$

   (b) $2(2x-1)^2-(2x-1)2x$

4. Simplify:

   (a) $\dfrac{1}{x+1} - \dfrac{x}{x-1}$

   (b) $\dfrac{3(x+h)^2 - 1 - (3x^2 - 1)}{h}$

5. Simplify:

(a) $-8^{\frac{1}{3}}$

(b) $\left(\frac{4}{9}\right)^{-\frac{1}{2}}$

(c) $\frac{\sqrt[4]{x^3} \cdot x}{x^2}$

6. Simplify:

$$\frac{\frac{1}{x+h+1} - \frac{1}{x+1}}{h}$$

7. If

$$a = x - 1 \qquad b = x + 1 \qquad c = x^2 - 1$$

Calculate and simplify $a^2 - b \cdot c$.

8. Perform the indicated instruction.

   (a) Rationalize the numerator and simplify: $\dfrac{\sqrt{x+h}-\sqrt{x}}{h}$

   (b) List all possible terms/factors and their context levels for

$$3y - 3(x^2y + xy) - 6xy(3x^2 - 1)^2$$

Tuesday/Thursday Classes: skip the rest.

9. Perform the indicated instruction.

   (a) Isolate the variable y in the expression

$$3y - 3(x^2y + xy) - 6xy(3x^2 - 1)^2 = 1$$

   (b) Solve for all real solutions of x for the equation

$$2x^2 - 5x = -2$$

(c) Solve for all real solutions of x for the equation

$$\frac{\frac{4}{x^2} - 1}{x} = 0$$