Name _____ Algebra Review Exam

MATH1100 February 3, 2020

Show all work. Clearly mark your answers. You may not work with anyone or seek help from anyone. This exam is to be done independently. It is due at the beginning of class on January 29, 2019. No late exams will be accepted.

1. (2pts each) Factor the expression completely.
   a) $2x^2 + 3x + 1$

   b) $16a^2b^3 - 4a^2b$

   c) $3x^2 - x - 4$

2. (5pts) Find the equation of the line that passes through the point (1,-2) and is perpendicular to $y = 1 - 2x$. Sketch both lines.

3. (5pts each) Simplify the given expression.

a) $\dfrac{10a^{-3/2}b^{-2}}{15a^2b^2}$

b) $(-2x^{1/2}y^{-4})^2(x^{3/4}y^2)^4$

c) $\dfrac{x^2+2x}{x} * \dfrac{x+2}{x^2-4}$

d) $\dfrac{3x+2}{x^2+4x+3} - \dfrac{x+3}{x+1}$

4. (4pts each) Given the equation $2x^2 - 4x - 1 = 0$

a) Solve the equation by **completing the square**.

b) Solve the equation by using the **quadratic formula**.

5. (4pts) Find the standard form of the equation of the circle for which the center is (-3,2) and has a solution point (-1,1).

6. (5pts each) Find all solutions of the equation. State if there are no solutions.

a) $-2(3x+5) = -3(2-3x)$

b) $\frac{6}{x+1} - \frac{2}{x+2} = \frac{-2x+1}{x^2+3x+2}$

c) $9x^2 + 6x + 1 = 0$

d) $x^2 + 2x - 5 = 0$

e) $|2x-3|-5=0$

f) $\left(x^2-7\right)^{3/2}=27$

g) $\sqrt{2x-3}-4=0$

h) (EXTRA CREDIT) Solve for x $\dfrac{2-\dfrac{1}{x}}{1+\dfrac{2}{x}}=4$

7. (5pts) Solve the inequality. **Sketch the solution on a number line and write as an interval**. $|3x-1| \geq 8$

8. (5pts) Solve the inequality $\frac{x+1}{x-3} < 0$ (set up test intervals & test point in each)

9. Consider the two points (-1,5) and (-3,1)
   a) (2pts) Find the distance between the two points.

   b) (2pts) Find the midpoint between the two points.

   c) (3pts) Find the equation of the line passing through the two points.