Traditional Math 100 Fall 2018
Final Examination

Answer all questions. You have two hours to do the test. Show your work clearly. Negligent, untidy or illegible work will be penalized. Make standard simplifications where appropriate. No notes, books or calculators of any type whatsoever are allowed.

1. Solve for x: $4(x-7)+5=3(x+2)-1$

2. (a) What is the line parallel to $y=(3/2)x-3$ but which passes through the point (2,3) ?

(b) What is the line perpendicular to $y = (3/2)x - 3$ but which passes through the point (2,3) ?

(c) At what point does the line in part (b) intersect the line $y = (3/2)x - 3$?

3. Solve: $|3x + 5| - 2 = 14$.

4. Solve the following:

(a) $\dfrac{3}{(4x-2)} = \dfrac{1}{(x+3)}$

(b) $\dfrac{4x-2}{2x} = \dfrac{2x}{x+3}$

5. Solve the following quadratic equations:

   (a) $x^2 + x - 6 = 0$

   (b) $x^2 - 8x + 2 = 0$

   (c) $x^2 - 4x + 7 = 0$

6. Solve for x, and comment on your solution : $\sqrt{7+x} = 5 - x$

7. Write in standard $a + ib$ form:

   (a) $(3 - 7i)(-2 + 5i)$

   (b) $\dfrac{3 - 7i}{-2 + 5i}$

8. Solve the quadratic inequality $x^2 - x > 12$

9. Find the difference quotient $\dfrac{g(x+h) - g(x)}{h}$ for $g(x) = 2x^2 + 7x - 4$.

10. Do the following polynomial divisions:

(a) $\dfrac{x^3 + 7x^2 + 10x - 8}{x^2 + 3x - 2}$

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

11. Find the roots of $x^3 + 8 = 0$

12. Solve for x and leave your answer in exact form : $6e^{x+1} - 2 = 10$

13. Using the properties of logarithms and assuming all variables positive, expand completely: $\log\left(\dfrac{x^3y}{z^2\sqrt{w}}\right)$

END