Borough of Manhattan Community College Department of Mathematics

MAT 012/051 Final /CUNY Examination Review

FORM C

NAME:______________________________________

1. Simplify: \(5\sqrt{7} + 2\sqrt{28} - 4\sqrt{63}\)

2. Simplify completely: \(\sqrt{\frac{30-2}{5}}\)

3. Perform the operation. Give the answer in scientific notation: \(\frac{3 \times 10^4}{12 \times 10^6}\)

4. Simplify: \(\frac{4x^3x^{10}}{(2x^2)^3}\)

5. Simplify: Add \(7x^2 - 8x + 10\) to \(-8x^2 + 2x - 12\)

6. Multiply and simplify: \((5x - 4)(x^2 - 3x - 1)\)

7. Simplify completely: \(\frac{33y^4+55y^3-11y^2}{-11y^2}\)

8. Factor completely: \(25x^2 - 1\)

9. Factor the trinomial completely: \(3x^2 + 11x - 20\)

10. Factor the polynomial: \(6x^3 - 4x^2 + 15x - 10\)

11. Write an equation: Four times a number subtracted from 16 is 22.

12. Solve for \(x\): \(\frac{x}{3} + 1 = \frac{x}{6}\)

13. Solve the system: \(\begin{cases} x - 6y = 3 \\ 4x + 3y = 21 \end{cases}\)

14. Solve for \(x\): \(z = 5x - y\)

15. Find all solutions to the equations: \(3x^2 = 15x\)

16. Find all solutions to the equations: \(2x^2 = 98\)

17. Find \(x\) and simplify your answer:

\[
\begin{align*}
\text{Diagram with right triangle:} & \\
x & = 8 \\
2 & \\
\end{align*}
\]

Updated: 11/26/13
18. Solve the inequality and graph the solution: \( 4(x + 5) \geq 4(2x + 1) \)

19. Evaluate: \( f(-3) \) for the function \( f(x) = \frac{x}{x+12} \)

20. Find \( x \)- and \( y \)-intercepts and then use them to draw the graph: \(-2x + 5y = 10\)

21. Find the equation of the line passing through the points given below. Write the equation in the slope intercept form. \((0, 2)\) and \((3, -6)\)

22. Find the equation of i) a horizontal line and ii) a vertical line that passes through the following point: \((4, -5)\)

23. Find the slope and \( y \)-intercept for the graph of the equation: \( 3x - y = 4 \)

24. Solve the following proportion problems: Carol spends 17 hours in a 2-week period practicing her culinary skills. How many hours does she practice in 5 weeks?

25. Solve the following percent problems: A company advertises cereal in a new 24-ounce box that contains 25% more cereal now. What was the original weight of the box?
1. $-3\sqrt{7}$
2. $2\sqrt{3}$
3. $2.5 \times 10^{-3}$
4. $\frac{x^7}{2}$
5. $-x^2 - 6x - 2$
6. $5x^3 - 19x^2 + 7x + 4$
7. $-3y^2 - 5y + 1$
8. $(5x + 1)(5x - 1)$
9. $(3x - 4)(x + 5)$
10. $(2x^2 + 5)(3x - 2)$
11. $16 - 4x = 22$
12. $x = -6$
13. $x = 5, y = \frac{1}{3}$
14. $x = \frac{2 + y}{3}$
15. $x = 0, x = 5$
16. $x = -7, x = 7$
17. $x = 2\sqrt{15}$
18. $x \leq 4$

19. $-\frac{1}{3}$
20. $x - \text{int}(-5,0)$ and $y - \text{int}(0,2)$
21. $y = -\frac{8}{3}x + 2$
22. i. $y = -5$ ii. $x = 4$
23. $m = 3$ and $y - \text{int}(0, -4)$
24. $\frac{85}{2}$ hours
25. 19.2 oz