MTH 111-01 FALL 2008 TEST 1A Solutions

Name: _____ Please show all of your work.

Simplify each of the following expressions. (Positive exponents on variables when appropriate.)

1. $2 + 5/7 = \frac{19}{7}$

2. $3 - \frac{1}{2/3} = \frac{3}{2}$

3. $\dfrac{1}{x-3} - \dfrac{x-3}{9} = \dfrac{9-(x-3)^2}{9(x-3)} = \dfrac{9-\left(x^2-6x+9\right)}{9(x-3)} = \frac{6x-x^2}{9(x-3)}$

4. $\dfrac{-3-2(4-8)}{-5-9(4-2)} = -\frac{5}{23}$

5. $\dfrac{(2)(-8)-4^2}{(-2)(-3)(-5)}\,\frac{16}{15}$

6. $\dfrac{|3-|4-11||}{-|5^2-(-3)^2|} = -\frac{1}{4}$

7. $(3x^3)(2x^2)(x^{-4})(4x^3) = 24x^4$

8. $\left(\dfrac{y}{x^2}\right)\left(\dfrac{x}{2y}\right)^{-2} = \frac{4y^3}{x^4}$

9. $\left(\dfrac{x^5y^4}{w^3z^0}\right)^{-2} = \frac{w^6}{x^{10}y^8}$

: 10. $\left(\dfrac{x^2y^{-2}}{x^{-2}y^3}\right)^{-2}\left(\dfrac{x^2y^{-4}}{x^{-2}y^{-2}}\right)^{2} = y^6$

11. $\sqrt[3]{-27z^6} = -3z^2$

12. $\sqrt{\dfrac{24x^6}{6y^4}} = 2\frac{x^3}{y^2}$

13. $\sqrt{12a^4b^7}\sqrt{6a^2b} = 6\sqrt{3}a^3b^4$

14. $(-27)^{2/3} = 9$

15. $8^{1/6}\cdot 8^{1/2} = 8^{1/6+1/2} = 8^{2/3} = 4$

16. $\left(-27x^9y^6\right)^{2/3} = 9x^6y^4$

17. $(3x-2)(7x-5) = 21x^2-29x+10$

18. $\left(x^{1/3}-3\right)\left(x^{1/3}+3\right) = x^{2/3}-9$

19. $(3x-2y)^2 = 9x^2-12xy+4y^2$

20. $(5x+3y)^2 = 30xy+25x^2+9y^2$

21. $\dfrac{9x^2+24x+16}{6x^2+17x+12} = \frac{(3x+4)}{2x+3}$

22. $\dfrac{3x^2-2x-1}{x^2+1}\cdot\dfrac{3x+1}{x^2-1} = \dfrac{(3x+1)(x-1)}{x^2+1}\cdot\dfrac{3x+1}{(x+1)(x-1)} = \dfrac{(3x+1)^2}{(x^2+1)(x+1)}$

23. $\dfrac{8x+1}{x^2-3x-4}-\dfrac{5x+2}{x^2-16} = \frac{8x+1}{(x-4)(x+1)}-\frac{5x+2}{(x+4)(x-4)} = \frac{(8x+1)(x+4)-(5x+2)(x+1)}{(x-4)(x+1)(x+4)} = \frac{26x+3x^2+2}{(x-4)(x+1)(x+4)}$

24. $\dfrac{x-4}{x^2+2x}\div\dfrac{16-4x}{3x+6} = \frac{3(x-4)(x+2)}{x\cdot 4(4-x)(x+2)} = -\frac{3}{4x}$

25. If set $A = \{2,4,6\}$, and set $B = \{1,3,5,6\}$ with $U = \{1,2,3,4,5,6,9\}$, then find:

a) $A' \cap B = \{1,3,5,9\} \cap \{1,3,5,6\} = \{1,3,5\}$

b) $B' \cup A = \{2,4,9\} \cup \{2,4,6\} = \{2,4,6,9\}$