

MATH 103 EXAM #2 KEY (SPRING 2011)

1. Get slope first: $m = \frac{14-5}{-8-(-2)} = \frac{9}{-6} = -\frac{3}{2}$. Equation of line is then $y - 5 = -\frac{3}{2}(x + 2)$, which in slope-intercept form is $y = -\frac{3}{2}x + 2$ and in standard form is $3x + 2y = 4$.

2a. $\frac{5}{w^2}$

2b. $(-2x^4)^5 = (-2)^5(x^4)^5 = -32x^{20}$

2c. $\frac{4a^5(a^{-1})^3}{(a^{-2})^{-4}} = \frac{4a^5a^{-3}}{a^8} = \frac{4a^2}{a^8} = \frac{4}{a^6}$

3. $(2z^2 + 3z - 1) - (4z^2 + 5z + 6) = 2z^2 + 3z - 1 - 4z^2 - 5z - 6 = -2z^2 - 2z - 7$

4a. $(5x - 3)(2x + 7) = 10x^2 + 35x - 6x - 21 = 10x^2 + 29x - 21$

4b. $(2y + 3)^2 = (2y + 3)(2y + 3) = 4y^2 + 12y + 9$

5. $\frac{2x^3 - 11x^2 + 25}{x - 5} = 2x^2 - x - 5$

6a. $15y^3z^3 + 27y^2z^4 - 36yz^5 = 3yz^3(5y^2 + 9yz - 12z^2)$

6b. $2(5 - x)^3 - 3(5 - x)^2 = (5 - x)^2[2(5 - x) - 3] = (5 - x)^2[10 - 2x - 3] = (5 - x)^2(7 - 2x)$

7. $3ma + 3mb + 2ab + 2b^2 = (3ma + 3mb) + (2ab + 2b^2) = 3m(a + b) + 2b(a + b) = (a + b)(3m + 2b)$

8a. $r^2 - 2r - 35 = (r - 7)(r + 5)$

8b. $15p^2 + 24pq + 8q^2$ is prime

8c. $18c^2 - 98d^2 = 2(9c^2 - 49d^2) = 2[(3c)^2 - (7d)^2] = 2(3c - 7d)(3c + 7d)$

8d. $27y^3 + 8 = (3y)^3 + 2^3 = (3y + 2)[(3y)^2 - (3y)(2) + 2^2] = (3y + 2)(9y^2 - 6y + 4)$

8e. $x^4 - 625 = (x^2)^2 - 25^2 = (x^2 - 25)(x^2 + 25) = (x^2 - 5^2)(x^2 + 25) = (x - 5)(x + 5)(x^2 + 25)$