SEW Math HW 2 Due Thursday July 26th
Please be sure to show all work for full credit.

1. Simplify the following expressions as much as possible. Leave your answers with positive exponents only.

$3x^{-3}(2y)^{-2}$ $= 3x^{-3}2^{-2}y^{-2}$

$= \frac{3}{4x^3y^2}$

4 points

$(5x^2y^5)\left(\frac{x^3y^{-2}}{w^{-4}}\right)^2$ $= 5x^2y^5\left(\frac{x^6w^8}{y^4}\right)$

$= 5x^8yw^8$

4 points

2. Multiply and simplify.

$(3x-7)^2$ $= 9x^2-42x+49$

2 points

3. Divide.

$(5x^3+3x^2-2x+24)\div(x+2)$

$x+2 \overline{)5x^3+3x^2-2x+24} = 5x^2-7x+12$

$5x^3+10x^2$

$-7x^2-2x+24$

$-7x^2-14x$

$12x+24$

$12x+24$

0

6 points

4. Solve each of the following.

$2x^2 = 5x+3$

$2x^2-5x-3=0$

$2x^2-6x+x-3=0$

$2x(x-3)+1(x-3)=0$

$(2x+1)(x-3)=0$

$x = -\frac{1}{2}, 3$

4 points

$x^3-4x=0$

$x(x^2-4)=0$

$x(x-2)(x+2)=0$

$x=0, 2, -2$

4 points

5. Factor the following.

$4x^2 - 25 = (2x)^2 - 5^2$

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

$x^2 + x - 6 = (x+3)(x-2)$

$2x^2 + 11x + 15 = 2x^2 + 6x + 5x + 15$

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

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

$x^2 - 4 = (x-2)(x+2)$

8 points

6. Use your answers from problem 1 to find the domain of the following rational expressions.

$\frac{x^2+x-6}{2x^2+11x+15} = \frac{(x+3)(x-2)}{(2x+5)(x+3)}$

$\frac{4x^2-25}{x^2-4} = \frac{(2x-5)(2x+5)}{(x-2)(x+2)}$

$\text{dom} = \{x \mid x \neq -\frac{5}{2}, -3\}$

$\text{dom} = \{x \mid x \neq 2, -2\}$

6 points

7. Perform the operation, simplifying as much as possible.

$\frac{x^2+x-6}{2x^2+11x+15} \cdot \frac{4x^2-25}{x^2-4} = \frac{(x+3)(x-2)}{(2x+5)(x+3)} \cdot \frac{(2x-5)(2x+5)}{(x-2)(x+2)}$

$= \frac{2x-5}{x+2}$

4 points

8. Perform the indicated operation.

$\frac{x}{x+7} - \frac{3}{x-7} + \frac{11}{x^2-49} = \frac{x}{x+7} - \frac{3}{x-7} + \frac{11}{(x-7)(x+7)}$ LCD: $(x-7)(x+7)$

$= \frac{x(x-7) - 3(x+7) + 11}{(x-7)(x+7)}$

$= \frac{x^2 - 7x - 3x - 21 + 11}{(x-7)(x+7)}$

$= \frac{x^2 - 10x - 10}{(x-7)(x+7)} = \frac{(x-11)(x+1)}{(x-7)(x+7)}$

6 points