1. (5 points) Determine the value of $\left|\dfrac{1}{3}-\dfrac{2}{5}\right|$.

2. (5 points) Simplify and write the final answer without negative exponents.
$\left(2x^2y^{-2}z^{-1}x^{-1}\right)^{-3}$

3. (5 points) Simplify. $(3x^3 + 6x^2 + 2x - 4) - (2x^3 - 3x^2 - 2x + 4)$

4. (10 points) Expand.
a) $\left(2x^2 - 1\right)^2$

b) $\left(2e^x + 3\right)\left(2e^x - 3\right)$

5. (5 points) Factor completely. $y^4 - 6y^3 + 9y^2$ Hit: Factor the common factor first.

6. (20 points) Simplify and reduce to lowest terms.

a) $\dfrac{9x^2-1}{x-1} \cdot \dfrac{x^2-1}{6x^2-2x}$ (Hint: Factor first, then simplify/cancel.)

b) $\dfrac{1}{x} - \dfrac{1}{x+2}$

7. (20 points) Solve the following equations for x. Check your answers.
a) $8(x-1) -2(7x+10) - 16 = 0$

b) $\dfrac{8}{x+2} - \dfrac{3}{x-2} = \dfrac{13}{x^2-4}$

8. (15 points)
a) Determine the equation of the straight line through the point (-1, 5) with slope m = -1 (This is exercise #40, section 2.6 Show all work.
b) What is the slope of any line perpendicular to that in part (a)? Explain.

9. (15 points)
a) Sketch the graph of the equation 2y + 3x = 1. Show all work.
b) What is the slope of the line in part (a)? Use your graph and the slope of this line to briefly explain the meaning of slope.

Extra Credit

Your company has purchased a $12,000 machine that has a useful life of 8 years. The salvage value of the machine at the end of 8 years is $2,000. (Hint: on the y-axis indicate the value and on the x-axis the years.) Write a linear equation that describes the book value of the machine each year. What is the book value of the machine at the end of year 4?