Math Camp

Homework 2

(1) Solve the following equations:

(a) $3x + 5 = 5x + 11$

(b) $x^2 + 8x = 20$

(c) $x^3 - 9x = 0$

(d) $\frac{x}{4} = \frac{5}{x+1}$

(e) $\frac{1}{x} + \frac{1}{x+3} = \frac{1}{2}$

(f) $x + \sqrt{x+5} = 7$ (Hint: rearrange to square a square root. Check your answers.)

(2) Use rules of exponents to write $\sqrt{\frac{a^8}{a^3}}$ as a raised to a single power.

(3) Simply the expression $\frac{x^5 - x^3}{x^2 + x}$ by canceling common factors.

(4) Solve the equations. Your answer may be in terms of e or a natural log if appropriate.

(a) $e^{2x+5} = e^3 e^{x-2}$

(b) $(e^{x+1})^2 = 5e^{x-1}$

(c) $\ln(2x + 1) = 3$

(d) $\log_3(x^2) - \log_3(x^3) = 2$

(e) $\log_2(x) + \log_2(x + 3) = 2$ (Hint: check your answers)

(5) Solve the following systems of equations:

(a)

$$x_1 + 3x_2 = 16$$
$$2x_1 + 2x_2 = 12$$

(b)

$$x^2 + y^2 = 8$$
$$x + y = 0$$

(c)

$$2a + b + 2c = 9$$
$$b + c = -1$$
$$3c = 6$$