

1. (8pts) Use formulas to expand:

a) $(2x - 5)^2 = 4x^2 - 20x + 25$

b) $(x^2 + 4a^3)^2 = x^4 + 8x^2a^3 + 16a^6$

c) $(x + 2)^3 = x^3 + 6x^2 + 12x + 8$

2. (4pts) Simplify and write without negative exponents:

a) $\frac{\left(\frac{x}{y}\right)^2 y^5}{x^{-4}} = \frac{\frac{x^2}{y^2} \cdot y^5 \cdot x^4}{1} = x^6 y^3$

b) $\frac{(x^2)^{-3} y^3}{(x^3 y)^{-2}} = \frac{x^{-6} y^3}{x^{-6} y^{-2}} = y^5$

¹Relax! It doesn't affect your grade

3. (5pts) Solve the equations.

a) $x^2 - 5x - 24 = 0$

$$(x-8)(x+3) = 0$$

$$x = 8, -3$$

b) $x^3 - 27 = 0$

$$x^3 = 27 \quad | \sqrt[3]{}$$

$$x = 3$$

4. (8pts) Simplify.

a) $\frac{x+3}{x^2-16} + \frac{2}{x^2+7x+12} = \frac{x+3}{(x-4)(x+4)} + \frac{2}{(x+4)(x+3)}$

$$= \frac{(x+3)^2 + 2(x-4)}{(x-4)(x+4)(x+3)} = \frac{x^2+6x+9+2x-8}{\quad \quad \quad}$$

$$= \frac{x^2+8x+1}{(x-4)(x+4)(x+3)}$$

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