

Algebra II Solved Problems

Section 1.2

29. $2x - 3\{x + 2[x - (x + 5)] + 1\}$

$$2x - 3\{x + 2[-5] + 1\}$$

$$2x - 3\{x - 10 + 1\}$$

$$2x - 3\{x - 9\}$$

$$2x - 3x + 27$$

$$-x + 27$$

37. $(3u - 2v)^2 - (2u - 3v)(2u + 3v)$

$$(3u - 2v)^2 = [9u^2 - 6uv - 6uv + 4v^2] = [9u^2 - 12uv + 4v^2]$$

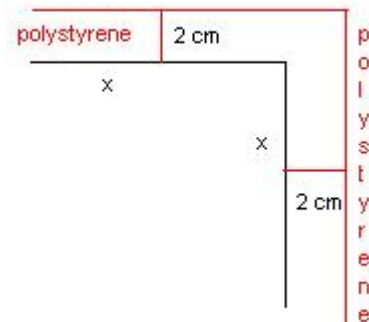
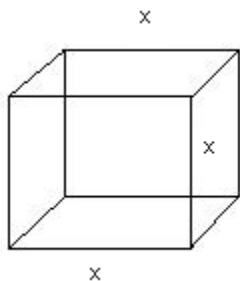
$$(2u - 3v)(2u + 3v) = [4u^2 + 6uv - 6uv - 9v^2] = [4u^2 - 9v^2]$$

$$[9u^2 - 12uv + 4v^2] - [4u^2 - 9v^2] = 9u^2 - 12uv + 4v^2 - 4u^2 + 9v^2$$

$$= 5u^2 - 12uv + 13v^2$$

68.

(View of the side of the cube when covered with polystyrene)



Volume of the Cube (V_C) = x^3

Volume of the cube covered in polystyrene:

$$(V_{C+P}) = (x + 2)^3$$

Algebra II Solved Problems

Therefore:

$$\begin{aligned}V_C &= x^3 \\V_{C+P} &= (x+2)^3 \\V_P &= V_{C+P} - V_C \\V_P &= [(x+2)^3] - [x^3] = [(x^2 + 4x + 4)(x+2)] - [x^3] = x^3 + 6x^2 + 12x + 8 - x^3 \\&= 6x^2 + 12x + 8\end{aligned}$$

Section 1.3

$$25. \quad \begin{aligned}4x^2 - 20x + 25 \\(2x-5)(2x-5)\end{aligned}$$

Section 1.4

$$29. \quad \begin{aligned}\frac{16-m^2}{m^2+3m-4} * \frac{m-1}{m-4} &= \frac{(-m-4)(m-4)}{(m+4)(m-1)} * \frac{(m-1)}{(m-4)} = \frac{(-m-4)(m-4)(m-1)}{(m+4)(m-1)(m-4)} \\&= \frac{(-m-4)}{m+4} = -\frac{(m+4)}{(m+4)} = -1\end{aligned}$$

$$39. \quad \begin{aligned}\frac{1+\frac{2}{x}-\frac{15}{x^2}}{1+\frac{4}{x}-\frac{5}{x^2}} &= \frac{1+\frac{2}{x}-\frac{15}{x^2}}{1+\frac{4}{x}-\frac{5}{x^2}} * \frac{x^2}{x^2} = \frac{x^2+2x-15}{x^2+4x-5} = \frac{(x+5)(x-3)}{(x+5)(x-1)} = \frac{(x-3)}{(x-1)}\end{aligned}$$

$$41. \quad \begin{aligned}\frac{\frac{1}{x+h}-\frac{1}{x}}{h} &= \frac{\frac{1}{x+h}-\frac{1}{x}}{h} * \left(\frac{x(x+h)}{x(x+h)}\right) = \frac{x(x+h)\left(\frac{1}{x+h}\right) - \left(x(x+h)\left(\frac{1}{x}\right)\right)}{h(x(x+h))} \\&= \frac{x-(x+h)}{h(x(x+h))} = \frac{-h}{h(x(x+h))} = \frac{-1}{x(x+h)}\end{aligned}$$

Section 1.5

$$33. \quad \left(\frac{2x^{-3}y^2}{4xy^{-1}}\right)^{-2} = \frac{(2x^{-3}y^2)^{-2}}{(4xy^{-1})^{-2}} = \frac{(4xy^{-1})^2}{(2x^{-3}y^2)^2} = \frac{4^2x^2y^{-2}}{2^2x^{-6}y^4} = \frac{16x^2y^{-2}}{4x^{-6}y^4} = \frac{4x^8}{y^6}$$

Algebra II Solved Problems

46. $2^{(3^2)} = 2^9 = 512$ $(2^3)^2 = 8^2 = 64$

71. mass of earth = 6.1×10^{27} grams where 1 gram = 2.2×10^{-3} lbs

$$6.1 \times 10^{27} \text{ grams} \left(\frac{2.2 \times 10^{-3} \text{ lbs}}{1 \text{ gram}} \right) = 1.342 \times 10^{25} \text{ lbs}$$

Section 1.6

29.
$$\left(\frac{a^{2/3} b^{-1/2}}{a^{1/2} b^{1/2}} \right)^2 = \frac{a^{4/3} b^{-1}}{ab} = \frac{a^{4/3}}{ab^2} = \frac{a^{1/3}}{b^2}$$

35. $(2x^{1/2} - 3y^{1/2})(2x^{1/2} + 3y^{1/2}) = 4x + 6x^{1/2}y^{1/2} - 6x^{1/2}y^{1/2} - 9y = 4x - 9y$

71. d = distance v = mph

$$d = .0212x^{7/3}$$

$$d = .0212(70)^{7/3} = 428 \text{ ft}$$

Section 1.7

29. $((xy)^{1/3})^{1/5} = (xy)^{1/15} = \sqrt[15]{xy}$

45. $\sqrt[6]{a^4(b-a)^2} = (a^4(b-a)^2)^{1/6} = a^{2/3}(b-a)^{1/3} = \sqrt[3]{a^2(b-a)}$

53.
$$\frac{\sqrt{2m}\sqrt{5}}{\sqrt{20m}} = \frac{\sqrt{2}\sqrt{m}\sqrt{5}}{\sqrt{20}\sqrt{m}} = \frac{\sqrt{10}}{\sqrt{20}} = \frac{\sqrt{5}\sqrt{2}}{\sqrt{5}\sqrt{4}} = \frac{\sqrt{2}}{2}$$

95.
$$M = \frac{M_o}{\sqrt{1 - \frac{v^2}{c^2}}} = \frac{M_o}{\sqrt{\frac{c^2 - v^2}{c^2}}} = \frac{M_o}{\sqrt{\frac{c^2 - v^2}{c^2}}} = \frac{M_o \sqrt{c^2}}{\sqrt{c^2 - v^2}} =$$

$$M = \frac{M_o c}{\sqrt{c^2 - v^2}} \times \frac{\sqrt{c^2 - v^2}}{\sqrt{c^2 - v^2}} = \frac{M_o c \sqrt{c^2 - v^2}}{c^2 - v^2}$$