

5.2 part 1

Pre-Calculus Math II

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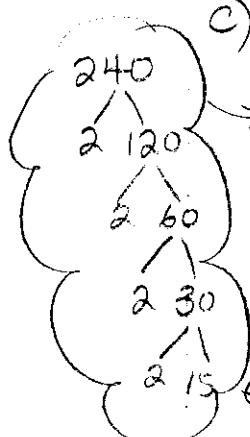
1. a)  $2\sqrt{5}(7-\sqrt{3})$   
 $14\sqrt{5}$

b)  $-\sqrt{32}(7-\sqrt{2})$   
 $-7\sqrt{64}$  ← 64 is a perfect square  
 $-7 \cdot 8$   
 $-56$

c)  $2\sqrt[4]{48}(\sqrt[4]{5})$   
 $2\sqrt[4]{240}$   
 $2\sqrt[4]{2^4 \cdot 15}$   
 $2 \cdot 2\sqrt[4]{15}$   
 $4\sqrt[4]{15}$

The index and exponent must be the same to take the root

d)  $4\sqrt{19x}(\sqrt{2x^2})$ ,  $x \geq 0$   
 $4\sqrt{38x^2 \cdot x}$   
 $4x\sqrt{38x}$   
 because the variable is inside the radical and the index is 2



e)  $\sqrt[3]{54y^7}(\sqrt[3]{6y^4})$   
 $\sqrt[3]{324y^{11}}$   
 $\sqrt[3]{3^3 \cdot 12y^9 \cdot y^2}$   
 $3y\sqrt[3]{12y^2}$   
 (must be a multiple of 3 because index is 3)

$324 = 27 \cdot 12$   
 $= 3^3 \cdot 12$

f)  $-\sqrt{6t}(3t^2\sqrt{\frac{t}{4}})$ ,  $t \geq 0$   
 $3t^2\sqrt{\frac{6t^2}{4}}$   
 $3t^2 \cdot \frac{t}{2}\sqrt{6}$   
 $\frac{3t^3}{2}\sqrt{6}$

3. a)  $-3(\sqrt{2}-4)+9\sqrt{2}$   
 $-3\sqrt{2}+12+9\sqrt{2}$   
 $6\sqrt{2}+12$   
 add "like" radicals

b)  $7(-1-2\sqrt{6})+5\sqrt{6}+8$   
 $-7-14\sqrt{6}+5\sqrt{6}+8$   
 $1-9\sqrt{6}$

c)  $4\sqrt{5}(\sqrt{3j}+8)-3\sqrt{15j}+\sqrt{5}$   
 $4\sqrt{15j}+32\sqrt{5}-3\sqrt{15j}+\sqrt{5}$   
 $\sqrt{15j}+33\sqrt{5}$

$j \geq 0$

d)  $3-\sqrt[3]{4k}(12+2\sqrt[3]{8})$   
 $3-12\sqrt[3]{4k}-2\sqrt[3]{32k}$   
 $3-12\sqrt[3]{4k}-2\sqrt[3]{8 \cdot 4k}$   
 $3-12\sqrt[3]{4k}-2 \cdot 2\sqrt[3]{4k}$   
 $3-12\sqrt[3]{4k}-4\sqrt[3]{4k}$   
 $3-16\sqrt[3]{4k}$   
 $k \in \mathbb{R}$

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4. a)  $(8\sqrt{7} + 2)(\sqrt{2} - 3)$   
 $8\sqrt{14} - 24\sqrt{7} + 2\sqrt{2} - 6$

b)  $(4 - 9\sqrt{5})(4 + 9\sqrt{5})$   
 $16 + 36\sqrt{5} - 36\sqrt{5} - 81 \cdot 5$   
 $16 - 405$   
 $-389$

c)  $(\sqrt{3} + 2\sqrt{15})(\sqrt{3} - \sqrt{15})$   
 $3 - \sqrt{45} + 2\sqrt{45} - 2 \cdot 15$   
 $3 - \sqrt{9 \cdot 5} + 2\sqrt{9 \cdot 5} - 30$   
 $-27 - 3\sqrt{5} + 2 \cdot 3\sqrt{5}$   
 $-27 - 3\sqrt{5} + 6\sqrt{5}$   
 $-27 + 3\sqrt{5}$

d)  $(6\sqrt[3]{2} - 4\sqrt{13})^2$   
 $(6\sqrt[3]{2} - 4\sqrt{13})(6\sqrt[3]{2} - 4\sqrt{13})$   
 $36 \cdot \sqrt[3]{2^2} - 24\sqrt{13}\sqrt[3]{2} - 24\sqrt{13}\sqrt[3]{2} + 16 \cdot 13$   
 $36\sqrt[3]{4} - 48(\sqrt{13}\sqrt[3]{2}) + 208$

e)  $(-\sqrt{6} + 2)(2\sqrt{2} - 3\sqrt{5} + 1)$

$-2\sqrt{12} + 3\sqrt{30} - \sqrt{6} + 4\sqrt{2} - 6\sqrt{5} + 2$   
 $-2\sqrt{4 \cdot 3} + 3\sqrt{30} - \sqrt{6} + 4\sqrt{2} - 6\sqrt{5} + 2$   
 $-2 \cdot 2\sqrt{3} + 3\sqrt{30} - \sqrt{6} + 4\sqrt{2} - 6\sqrt{5} + 2$   
 $-4\sqrt{3} + 3\sqrt{30} - \sqrt{6} + 4\sqrt{2} - 6\sqrt{5} + 2$