

Monday November 7, 2011
 #10# 12
 Aim: How do we simplify Radicals expressions of Sums and differences?
 Do Now: Simplify
 $\sqrt{\frac{25}{3}} = \frac{\sqrt{25}}{\sqrt{3}} = \frac{5}{\sqrt{3}}$ note: it has a radical in the denominator.
 I- Rationalizing the Denominator
 1) $\frac{5}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{3}}{\sqrt{9}} = \frac{5\sqrt{3}}{3}$ note: the denominator it's not a radical
 2) $\sqrt{\frac{4}{3}} = \frac{\sqrt{4}}{\sqrt{3}} = \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{\sqrt{9}} = \frac{2\sqrt{3}}{3}$

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3) Which expression is in simplest form?
 I) $\sqrt{18} = \sqrt{9 \cdot 2} = 3\sqrt{2}$
 12) $\sqrt{\frac{1}{5}} = \frac{\sqrt{1}}{\sqrt{5}} = \frac{1}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{\sqrt{25}} = \frac{\sqrt{5}}{5}$
 III) 3) $\sqrt{23} = \text{Simplified!}$
 12) 4) $\frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

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II- Adding and Subtracting Radical Expressions
 1) Like radicals:
 ex) $2\sqrt{5}$ and $4\sqrt{5}$ ✓
 $6\sqrt{x}$ and $-2\sqrt{x}$ ✓
 $4\sqrt{10}$ and $10\sqrt{4}$ ✗
 $-3\sqrt{18}$ and $3\sqrt{2}$
 $\downarrow \quad \downarrow$
 $-3 \cdot \sqrt{9 \cdot 2}$
 $-3 \cdot 3 \cdot \sqrt{2} = -9\sqrt{2}$
 2) Add/Subtract only Like Radicals
 ex) $2\sqrt{5} + 4\sqrt{5} = 6\sqrt{5}$
 $6\sqrt{x} - 2\sqrt{x} = 4\sqrt{x}$
 $6\sqrt{x} - (-2\sqrt{x}) = 8\sqrt{x}$
 $4\sqrt{10} + 10\sqrt{4} =$
 $3\sqrt{7t} + \sqrt{7t} = 4\sqrt{7t}$

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3) Unlike terms
 ex) 2 and $\sqrt{2}$
 $6\sqrt{x}$ and $\sqrt{6x}$
 III- Simplify
 1) $5\sqrt{6} - 3\sqrt{6} + 2\sqrt{5} = 2\sqrt{6} + 2\sqrt{5}$
 2) $9\sqrt{2} + \sqrt{8} = 9\sqrt{2} + 2\sqrt{2} = 11\sqrt{2}$
 $\downarrow \quad \downarrow$
 $\sqrt{4} \sqrt{2}$
 $2\sqrt{2}$

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3) $\sqrt{50} + \sqrt{8} = \cancel{7\sqrt{2}}$
 $\downarrow \quad \downarrow$
 $\sqrt{25} \sqrt{2} + \sqrt{4} \sqrt{2}$
 $5\sqrt{2} + 2\sqrt{2} = 7\sqrt{2}$

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