10/25/2012 - Sec 8.5 Math 1010

~~#48~~

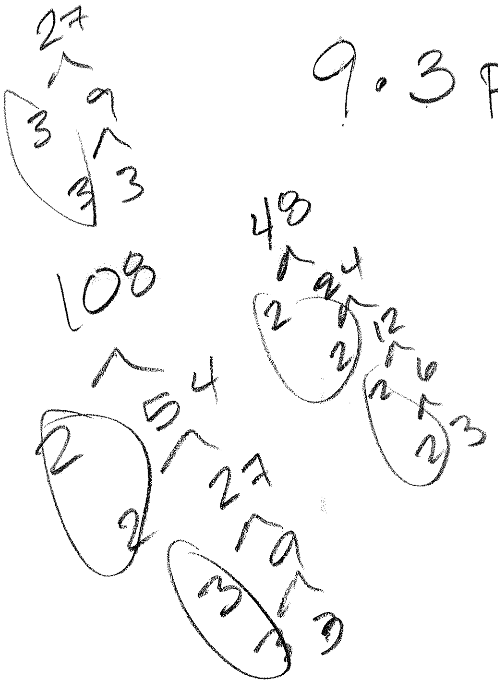
~~#18~~

#62

#54

#18

$$9\sqrt{27p^2} - 14\sqrt{108p^2} + 2\sqrt{48p^2}$$



$$9 \cdot 3p\sqrt{3} - 14 \cdot 2 \cdot 3p\sqrt{3} + 2 \cdot 2 \cdot 2p\sqrt{3}$$

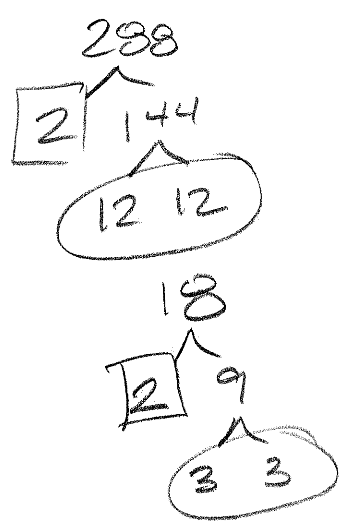
$$27p\sqrt{3} - 84p\sqrt{3} + 8p\sqrt{3}$$

$$(27 - 84 + 8)p\sqrt{3}$$

$$\boxed{-49p\sqrt{3}}$$

#48

$$5\sqrt{\frac{288}{25}} + 21\frac{\sqrt{2}}{\sqrt{18}}$$



$$\frac{5}{1}\frac{\sqrt{288}}{\sqrt{25}} + \frac{21}{1} \cdot \frac{\sqrt{2}}{\sqrt{18}}$$

$$\frac{\cancel{5} \cdot 12\sqrt{2}}{\cancel{5}} + \frac{\overset{7}{\cancel{21}} \cdot \cancel{\sqrt{2}}}{\cancel{3}\cancel{\sqrt{2}}}$$

$$\boxed{12\sqrt{2} + 7}$$

#54

$$-4\sqrt[3]{\frac{4}{t^9}} + 3\sqrt[3]{\frac{9}{t^{12}}}$$

$$\frac{-4}{1} \cdot \frac{\sqrt[3]{4}}{\sqrt[3]{t^9}} + \frac{3}{1}\,\frac{\sqrt[3]{9}}{\sqrt[3]{t^{12}}}$$

4 → 2, 2

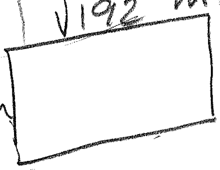
9 → 3, 3

$$\frac{-4\sqrt[3]{4}}{t^3 \cdot t} + \frac{3\sqrt[3]{9}}{t^4} \qquad \text{LCD: } t^4$$

$$\boxed{\frac{-4t\sqrt[3]{4} + 3\sqrt[3]{9}}{t^4}}$$

#62

$\sqrt{192}$ m = L



w = $\sqrt{48}$ m

Find the perimeter

$P = 2L + 2W$

$P = 2\sqrt{192} + 2\sqrt{48}$

$2 \cdot 2 \cdot 2 \cdot 2\sqrt{3} + 2 \cdot 2 \cdot 2 \cdot \sqrt{3}$

$16\sqrt{3} + 8\sqrt{3}$

$(16+8)\sqrt{3}$

$\boxed{24\sqrt{3}\text{ m}}$

192 → 2, 96 → 2, 48 → 2, 24 → 2, 12 → 2, 6 → 2, $\boxed{3}$

48 → 2, 24 → 2, 12 → 2, 6 → 2, $\boxed{3}$

Sec 8.5 Multiplying & Dividing Radicals

Multiplying: Distribute & Simplify

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

$$\sqrt{5}\cdot\sqrt{6} + 1\cdot\sqrt{5} + 3\cdot\sqrt{6} + 3\cdot 1$$

$$\sqrt{5\cdot 6} + \sqrt{5} + 3\sqrt{6} + 3$$

$$\boxed{\sqrt{30} + \sqrt{5} + 3\sqrt{6} + 3}$$

30
2 15
3 5

FYI: Answers in this section are messier than normal

#7 $\sqrt{6}\,(3+\sqrt{2})$

$$3\sqrt{6} + \sqrt{6}\cdot\sqrt{2}$$

$$3\sqrt{6} + \sqrt{6\cdot 2}$$

$$3\sqrt{6} + \sqrt{12}$$

$$\boxed{3\sqrt{6} + 2\sqrt{3}}$$

12
2 6
2 $\boxed{3}$

36 $(\sqrt[3]{9z} - 2)(5\sqrt[3]{9z} + 7)$

$5\sqrt[3]{9z \cdot 9z} + 7\sqrt[3]{9z} - 10\sqrt[3]{9z} - 14$

$5\sqrt[3]{81z^2} + 7\sqrt[3]{9z} - 10\sqrt[3]{9z} - 14$

$5 \cdot 3\sqrt[3]{3z^2} + 7\sqrt[3]{9z} - 10\sqrt[3]{9z} - 14$

$\boxed{15\sqrt[3]{3z^2} - 3\sqrt[3]{9z} - 14}$

81
3 27
3 9
3 $\boxed{3}$

9
$3 \cdot 3$

Dividing: Rationalize the Denominator and Simplify

Recall: a simplified Radical has No Radicals in Denominators.

Ex: $\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{2 \cdot 2}} = \frac{\sqrt{2}}{2}$

Ex: $\frac{5}{\sqrt{11}} \cdot \frac{\sqrt{11}}{\sqrt{11}} = \frac{5\sqrt{11}}{\sqrt{11 \cdot 11}} = \frac{5\sqrt{11}}{11}$

Not able to cross off since one of them is under a Square Root

Ex: $\frac{-6}{\sqrt{12}} \cdot \frac{\sqrt{12}}{\sqrt{12}} = \frac{-6\sqrt{12}}{12} = \frac{-\cancel{6} \cdot \cancel{2}\sqrt{3}}{\cancel{12}_{\cancel{2}\,1}} = -\sqrt{3}$

or " $\frac{-\cancel{6}^{3}}{\cancel{12}\sqrt{3}} = \frac{-3}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{-\cancel{3}\sqrt{3}}{\cancel{3}} = -\sqrt{3}$ same

12
2 6
2 2 $\boxed{3}$

$$\sqrt[3]{\frac{15}{32}} = \frac{\sqrt[3]{15}}{\sqrt[3]{32}} = \frac{\sqrt[3]{15}}{2\sqrt[3]{2\cdot 2}} \cdot \frac{\sqrt[3]{2}}{\sqrt[3]{2}}$$

$$= \frac{\sqrt[3]{30}}{2\sqrt[3]{2\cdot 2\cdot 2}}$$

$$= \frac{\sqrt[3]{30}}{2\cdot 2}$$

$$= \frac{\sqrt[3]{30}}{4}$$

32
2 16
2 8
4
2 2

15
3 5

Ex: $\dfrac{3}{(1+\sqrt{2})} \cdot \dfrac{\sqrt{2}}{\sqrt{2}} = \dfrac{3\sqrt{2}}{\sqrt{2}+2}$