$$\underbrace{(3\sqrt{6}-2)}_{\text{Binomial}}\underbrace{(\sqrt{8}-5\sqrt{10})}_{\text{Binomial}}+\underbrace{(3-4\sqrt{2})^2}_{(3-4\sqrt{2})(3-4\sqrt{2})}-\frac{16}{\sqrt{8}}+2\sqrt{5}\left(4\sqrt{12}-\sqrt{500}\right)$$

$(3\sqrt{6})(\sqrt{8})$ $\quad (4\sqrt{2})^2$

$$=3\sqrt{48}-15\sqrt{60}-2\sqrt{8}+10\sqrt{10}+9-24\sqrt{2}+32-\frac{16}{\sqrt{8}}\left(\frac{\sqrt{8}}{\sqrt{8}}\right)+8\sqrt{60}-2\sqrt{2500}$$

$3(4\sqrt{3})$ $\quad (2\sqrt{15})$

$$=12\sqrt{3}-30\sqrt{5}-4\sqrt{2}+10\sqrt{10}+9-24\sqrt{2}+32-\frac{16\sqrt{8}}{8}+16\sqrt{15}-2(50)$$

$$-2\sqrt{8}$$
$$-2(2\sqrt{2})$$
$$-4\sqrt{2}$$

$$=12\sqrt{3}-14\sqrt{5}-32\sqrt{2}+10\sqrt{10}-59$$

- Rationalizing the Denominator...

(II) Binomial Denominator

Conjugate $5-\sqrt{2} \Rightarrow 5+\sqrt{2}$

The **conjugate** of the two-term expression $a+b$ is $a-b$ and visa versa. $-3x+7 \Rightarrow -3x-7$

For each of the following, identify the conjugate of the expression. Then find the product of the expression and its conjugate.

Expression	Conjugate	Product
$(a+b)$	$(a-b)$	$a^2-ab+ab-b^2$ a^2-b^2
$a-\sqrt{3}$	$a+\sqrt{3}$	
$(\sqrt{x}-7)$	$\sqrt{x}+7$	$x+7\sqrt{x}-7\sqrt{x}-49$ $x-49$
$2\sqrt{3}+4\sqrt{5}$	$2\sqrt{3}-4\sqrt{5}$	

Fact The product of a square-root expression and it's conjugate is an expression containing no square roots (i.e. a rational expression).

Use this fact to rationalize the following...

$$\frac{3\sqrt{6}}{3-\sqrt{3}}\left(\frac{3+\sqrt{3}}{3+\sqrt{3}}\right)$$

$$= \frac{9\sqrt{6}+3\sqrt{18}}{9-3}$$

$$= \frac{9\sqrt{6}+9\sqrt{2}}{6} = \frac{3\sqrt{6}+3\sqrt{2}}{2}$$

$$= \frac{9\sqrt{6}}{6}+\frac{9\sqrt{2}}{6}$$

$$= \frac{3\sqrt{6}}{2}+\frac{3\sqrt{2}}{2}$$

$$\frac{6\sqrt{5}}{-\sqrt{8}+\sqrt{5}} \left(\frac{-\sqrt{8}-\sqrt{5}}{-\sqrt{8}-\sqrt{5}}\right)$$

$$= \frac{-6\sqrt{40}-6(5)}{8-5}$$

$$= \frac{-12\sqrt{10}-30}{3} \quad \begin{matrix} \div 3 \\ \div 3 \\ 3 \div 3 \end{matrix}$$

$$= \frac{-4\sqrt{10}-10}{1}$$

Practice Problems....

Worksheet

Attachments

Image (19).jpg