

Expand and simplify.

$$(4 - 3\sqrt{10})(9 - 2\sqrt{15})$$

	4	$-3\sqrt{10}$	
9	36	$-27\sqrt{10}$	
$-2\sqrt{15}$	$-8\sqrt{15}$	$6\sqrt{150}$	

$\rightarrow 6\sqrt{25 \cdot 6} = 30\sqrt{6}$

$$36 - 27\sqrt{10} - 8\sqrt{15} + 30\sqrt{6}$$

Expand and simplify.

$$(5\sqrt{2} - \sqrt{7})(3\sqrt{2} - 9\sqrt{7})$$

	$5\sqrt{2}$	$-\sqrt{7}$	
$3\sqrt{2}$	$15 \cdot 2 = 30$	$-3\sqrt{14}$	
$-9\sqrt{7}$	$-45\sqrt{14}$	$9 \cdot 7 = 63$	

$$93 - 48\sqrt{14}$$

Remember what the result always is when you expand $(a + b)(a - b) = a^2 - b^2$

These factors are called conjugates

Expand and simplify.

$$4. \quad (7 + \sqrt{5})(7 - \sqrt{5}) = 49 - 5 = 44$$

$$a^2 = 7^2 = 49$$

$$b^2 = (\sqrt{5})^2 = 5$$

$$(8\sqrt{3} - \sqrt{2})(8\sqrt{3} + \sqrt{2}) = 192 - 2 = 190$$

$$a^2 = (8\sqrt{3})^2 = 64 \cdot 3 = 192$$

$$b^2 = (\sqrt{2})^2 = 2$$

To rationalize a denominator involving a sum or difference involving square roots you multiply the numerator and denominator by the

Conjugate of the Denominator.

Rationalize the denominator.

$$\frac{10}{4 + \sqrt{6}} \cdot \frac{4 - \sqrt{6}}{4 - \sqrt{6}} = \frac{10(4 - \sqrt{6})}{16 - 6} = \boxed{4 - \sqrt{6}}$$

Rationalize the denominator.

$$\frac{11 + \sqrt{5}}{3 - 4\sqrt{5}} \cdot \frac{3 + 4\sqrt{5}}{3 + 4\sqrt{5}} = \frac{53 + 47\sqrt{5}}{-71}$$

9 - 80

	11 + 15	
3	33	315
415	4415	20

Rationalize the denominator.

$$\frac{22}{\sqrt{7} - \sqrt{3}} \cdot \frac{\sqrt{7} + \sqrt{3}}{\sqrt{7} + \sqrt{3}} = \frac{22(\sqrt{7} + \sqrt{3})}{4} = \frac{11(\sqrt{7} + \sqrt{3})}{2}$$

OR

$$\frac{11\sqrt{7} + 11\sqrt{3}}{2}$$

Rationalize the denominator.

$$\frac{\sqrt{10} - \sqrt{2}}{\sqrt{3} + 2}$$