Radicals & Conjugates

1. Express each of the following in simplest radical form, combining terms where possible.

a) $\sqrt{25} + \sqrt{45} - \sqrt{20}$

b) $3\sqrt{3} - \sqrt{\frac{3}{4}} + \sqrt{\frac{1}{3}}$

2. Simplify each of the following quotients as far as possible.

a) $\left(\sqrt{21} - \sqrt{3}\right) \div \sqrt{3}$

b) $\left(\sqrt{5} + 4\right) \div \left(\sqrt{5} + 1\right)$

c) $\left(3 - \sqrt{2}\right) \div \left(3\sqrt{2} - 5\right)$

d) $\left(2\sqrt{5} - \sqrt{3}\right) \div \left(3\sqrt{5} - 4\sqrt{2}\right)$

3. Rewrite each of the following expressions as a rational number or in simplest radical form.

a) $\sqrt{3}\,(\sqrt{3} - 1)$

b) $\left(5 + \sqrt{3}\right)^2$

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1. Express each of the following in simplest radical form, combining terms where possible.

a) $\sqrt{25}+\sqrt{45}-\sqrt{20}$

$5+\sqrt{5}$

b) $3\sqrt{3}-\sqrt{\frac{3}{4}}+\sqrt{\frac{1}{3}}$

$\frac{17\sqrt{3}}{6}$

2. Simplify each of the following quotients as far as possible.

a) $\left(\sqrt{21}-\sqrt{3}\right)\div\sqrt{3}$

$\sqrt{7}-1$

b) $\left(\sqrt{5}+4\right)\div\left(\sqrt{5}+1\right)$

$\frac{1}{4}\left(1+3\sqrt{5}\right)$

c) $\left(3-\sqrt{2}\right)\div\left(3\sqrt{2}-5\right)$

$-\frac{1}{7}\left(9+4\sqrt{2}\right)$

d) $\left(2\sqrt{5}-\sqrt{3}\right)\div\left(3\sqrt{5}-4\sqrt{2}\right)$

$\frac{1}{13}\left(30-3\sqrt{15}+8\sqrt{10}-4\sqrt{6}\right)$

3. Rewrite each of the following expressions as a rational number or in simplest radical form.

a) $\sqrt{3}\left(\sqrt{3}-1\right)$

$3-\sqrt{3}$

b) $\left(5+\sqrt{3}\right)^2$

$28+10\sqrt{3}$