

1. Find the conjugate of the following expressions.

(a) $x\sqrt{3} + 2$

Solution: $x\sqrt{3} - 2$

(b) $4\sqrt{7} + 3x$

Solution: $4\sqrt{7} - 3x$

(c) $a - b$

Solution: $a + b$

(d) $\sqrt{a} + \sqrt{b}$

Solution: $\sqrt{a} - \sqrt{b}$

(e) $\sqrt{x^2 + x - 9} + x$

Solution: $x\sqrt{x^2 + x - 9} - x$

(f) $a + \sqrt{7}$

Solution: $a - \sqrt{7}$

2. Rationalize the denominator.

(a) $\frac{3}{\sqrt{5}}$

Solution: $\frac{3\sqrt{5}}{5}$

(b) $\frac{\sqrt{b}}{\sqrt{a}}$

Solution: $\frac{\sqrt{ab}}{a}$

(c) $\frac{\sqrt{3}}{\sqrt[5]{4}}$

Solution: $\frac{\sqrt{3}\sqrt[5]{4^4}}{4}$

(d) $\frac{x+1}{\sqrt{x^2+4}-\sqrt{x}}$

Solution: $\frac{(x+1)(\sqrt{x^2+4}+\sqrt{x})}{x^2-x+4}$

(e) $\frac{1+\sqrt{3}}{1-\sqrt{3}}$

Solution: $\frac{(1+\sqrt{3})^2}{-2}$

(f) $\frac{4}{5-\sqrt{7}}$

Solution: $\frac{2(5+\sqrt{7})}{9}$

(g) $\frac{1}{\sqrt{3}} + 2\sqrt{12}$

Solution: $\frac{13\sqrt{3}}{3}$

(h) $\frac{-2}{\sqrt[4]{x^2y^9}13}$

Solution: $\frac{-2(13)^{\frac{3}{4}}x^{\frac{3}{2}}y^{\frac{27}{4}}}{13x^2y^9}$