

Section 12.2 Operations with Radical Expressions

Assignment: p.719 #18-44e, 58, 59; 12.2 Worksheet

conjugates

Examples

1. Simplify.

a. $3\sqrt{7} - 5\sqrt{7} + 12\sqrt{7}$

b. $8\sqrt{5} + \sqrt{125}$

2. Multiply.

a. $\sqrt{12} \cdot \sqrt{3}$

b. $\sqrt{3}(7 + \sqrt{5})$

c. $(1 - \sqrt{3})^2$

d. $(6 - \sqrt{2})(6 + \sqrt{2})$

3. Simplify.

a. $\frac{1}{\sqrt{3}}$

b. $\frac{2\sqrt{5}}{\sqrt{2}}$

c. $\frac{4}{3 + \sqrt{2}}$

Section 12.3 Solving Radical Equations

Assignment: p.725 #15-42 multiples of 3, 66, 67

extraneous solution A solution that does not satisfy the original equation

• Goal: $\sqrt{\quad} = \text{everything else}$

Examples

1. $\sqrt{x-10}=0$
 $+10 +10$
 $(\sqrt{x})^2 = (0)^2$
 $x = 10$

$\sqrt{100-10}=0$
 $10-10=0$
 $0=0$

2. $\sqrt{3x+1}-2=6$
 $+2 +2$
 $(\sqrt{3x+1})^2 = (8)^2$

$3x+1=64$
 $-1 -1$

$3x = 63$
 $\frac{3x}{3} = \frac{63}{3}$
 $x = 21$

$\sqrt{63+1}-2=6$
 $\sqrt{64}-2=6$
 $8-2=6$
 $6=6$

3. $\sqrt{x+9}=0$
 $-9 -9$
 $(\sqrt{x})^2 = (-9)^2$
 $x \neq 81$

$\sqrt{81+9}=0$
 $9+9=0$
 $18 \neq 0$

4. $\sqrt{x^2(30-x)}^2$
 $x^2 = 30-x$
 $-30 +x$

$x^2 + x - 30 = 0$
 $(x-5)(x+6) = 0$
 $x = 5$ $x \neq -6$

5. $(\sqrt{4x-3})^2 = 6^2$
 $4x-3 = x^2-4x+3$
 $-4x+3$

$0 = x^2 - 4x + 3$
 $0 = (x-3)(x-1)$
 $x = 3$ $x = 1$

$\sqrt{16-3} = 3$ $\sqrt{4-3} = 1$
 $\sqrt{9} = 3$ $1 = 1$
 $3 = 3$

$5 = \sqrt{25}$
 $5 = 5$ ✓

$-6 = \sqrt{36}$
 $-6 \neq 6$