PRACTICE EXERCISE

1. Rationalize the denominator in each of the following expressions and then simplify each.

a) $\dfrac{1}{x-2\sqrt{x}}$

b) $\dfrac{x-5}{\sqrt{x}+\sqrt{5}}$

c) $\dfrac{4x}{\sqrt{2-x}+\sqrt{2}}$

2. Rationalize the numerator in each of the following expressions and then simplify each.

a) $\dfrac{\sqrt{2x-5}-\sqrt{7}}{x-6}$

b) $\sqrt{x^2+x-11}-1$

c) $\dfrac{\dfrac{1}{\sqrt{x}}-4\sqrt{x}}{4x-1}$

8. $=\left(x-2\sqrt{5}\right)\left(x+2\sqrt{5}\right)$

x^2-20

$=\left(x-\sqrt{20}\right)\left(x+\sqrt{20}\right)$

$=\left(x-2\sqrt{5}\right)\left(x+2\sqrt{5}\right)$

Lesson 2—Rationalizing Numerators and Denominators

PRACTICE EXERCISE
Answers and Solutions

1. a) $=\dfrac{x+2\sqrt{x}}{x^2-4x}$

$\dfrac{1}{x-2\sqrt{x}}\cdot\dfrac{x+2\sqrt{x}}{x+2\sqrt{x}}$

$=\dfrac{x+2\sqrt{x}}{x^2-4x}$

b) $=\left(\sqrt{x}-\sqrt{5}\right)$

$\dfrac{x-5}{\sqrt{x}+\sqrt{5}}\cdot\dfrac{\sqrt{x}-\sqrt{5}}{\sqrt{x}-\sqrt{5}}$

$=\dfrac{(x-5)\left(\sqrt{x}-\sqrt{5}\right)}{x-5}$

$=\left(\sqrt{x}-\sqrt{5}\right)$

c) $=-4\left(\sqrt{2-x}-\sqrt{2}\right)$

$\dfrac{4x}{\sqrt{2-x}+\sqrt{2}}$

$=\dfrac{4x}{\sqrt{2-x}+\sqrt{2}}\cdot\dfrac{\sqrt{2-x}-\sqrt{2}}{\sqrt{2-x}-\sqrt{2}}$

$=\dfrac{4x\left(\sqrt{2-x}-\sqrt{2}\right)}{2-x-2}$

$=-4\left(\sqrt{2-x}-\sqrt{2}\right)$

2. a) $=\dfrac{2}{\left(\sqrt{2x-5}+\sqrt{7}\right)}$

$\dfrac{\sqrt{2x-5}-\sqrt{7}}{x-6}\cdot\dfrac{\sqrt{2x-5}+\sqrt{7}}{\sqrt{2x-5}+\sqrt{7}}$

$=\dfrac{(2x-5)-7}{(x-6)\left(\sqrt{2x-5}+\sqrt{7}\right)}$

$=\dfrac{2x-12}{(x-6)\left(\sqrt{2x-5}+\sqrt{7}\right)}$

$=\dfrac{2(x-6)}{(x-6)(\sqrt{2x-5}+\sqrt{7})}$

$=\dfrac{2}{\left(\sqrt{2x-5}+\sqrt{7}\right)}$

b) $=\dfrac{x^2+x-12}{\sqrt{x^2+x-11}+1}$

$\dfrac{\sqrt{x^2+x-11}-1}{1}\cdot\dfrac{\sqrt{x^2+x-11}+1}{\sqrt{x^2+x-11}+1}$

$=\dfrac{x^2+x-11-1}{\sqrt{x^2+x-11}+1}$

$=\dfrac{x^2+x-12}{\sqrt{x^2+x-11}+1}$

c) $=\dfrac{-1}{\sqrt{x}}$

$\dfrac{\dfrac{1}{\sqrt{x}}-4\sqrt{x}\cdot\dfrac{\sqrt{x}}{\sqrt{x}}}{4x-1}$

$=\dfrac{\dfrac{1-4x}{\sqrt{x}}}{4x-1}$

$=\dfrac{1-4x}{\sqrt{x}(4x-1)}$

$=\dfrac{-(4x-1)}{\sqrt{x}(4x-1)}$

$=\dfrac{-1}{\sqrt{x}}$

