Chapter 12-1 to 12-3 Test Review

Find the domain of the function.

1) $y = \sqrt{x} - 5$

all nonnegative numbers; $x \geq 0$

Find the range of the function.

2) $y = \sqrt{x} - 5$

$y \geq -5$

Find the domain of the function.

3) $y = \sqrt{x+3}$

$x \geq -3$

Find the range of the function.

4) $y = \sqrt{x+3}$

$y \geq 0$

Find the domain of the function.

5) $y = \sqrt{4x - 3}$

$x \geq 3/4$

Find the range of the function.

6) $y = \sqrt{4x - 3}$

$y \geq 0$

Simplify the expression.

7) $8\sqrt{7} - 15\sqrt{7}$

$-7\sqrt{7}$

Simplify the expression.

8) $2\sqrt{8} + 3\sqrt{32}$

$2\sqrt{4}\cdot\sqrt{2} + 3\sqrt{16}\cdot\sqrt{2}$

$4\sqrt{2} + 12\sqrt{2}$

$16\sqrt{2}$

Simplify the expression.

9) $\sqrt{20} - \sqrt{45} + \sqrt{80}$

$\sqrt{4} \cdot \sqrt{5} - \sqrt{9} \cdot \sqrt{5} + \sqrt{16} \cdot \sqrt{5}$

$2\sqrt{5} - 3\sqrt{5} + 4\sqrt{5}$

$3\sqrt{5}$

Simplify the expression.

10) $\sqrt{3}\left(7-\sqrt{6}\right)$

$7\sqrt{3}-\sqrt{18}$

$7\sqrt{3}-\sqrt{9}\cdot\sqrt{2}$

$7\sqrt{3}-3\sqrt{2}$

Simplify the expression.

11) $(4+\sqrt{10})^2$

$(4+\sqrt{10})(4+\sqrt{10})$ FOIL

$16+4\sqrt{10}+4\sqrt{10}+\sqrt{100}$

$16+8\sqrt{10}+10$

$26+8\sqrt{10}$

Simplify the expression.

12) $\dfrac{4}{\sqrt{24}} \cdot \dfrac{\sqrt{24}}{\sqrt{24}}$

$$\frac{4\sqrt{24}}{24} = \frac{4 \cdot \sqrt{4} \cdot \sqrt{6}}{24} = \frac{8\sqrt{6}}{24} = \frac{\sqrt{6}}{3}$$

Simplify the expression.

13) $\dfrac{3}{5-\sqrt{2}} \cdot \dfrac{5+\sqrt{2}}{5+\sqrt{2}}$

$\dfrac{15+3\sqrt{2}}{25-2} = \dfrac{15+3\sqrt{2}}{23}$

Solve the equation. Check for extraneous solutions.

14) $\sqrt{x} - 11 = 0$

$(\sqrt{x})^2 = (11)^2$

$x = 121$

Solve the equation. Check for extraneous solutions.

15) $\sqrt{2x-1} + 4 = 7$

$(\sqrt{2x-1})^2 = (3)^2$

$2x - 1 = 9$

$2x = 10$

$x = 5$

Solve the equation. Check for extraneous solutions.

16) $\sqrt{x+20} = x$

$\left(\sqrt{x+20}\right)^2 = (x)^2$

$x + 20 = x^2$

$x^2 - x - 20 = 0$

$(x-5)(x+4) = 0$

$x = 5$ and -4

Only 5 is a solution; -4 is extraneous.

Solve the equation. Check for extraneous solutions.

17) $12 = \sqrt{3x+1} + 7$

$(5)^2 = (\sqrt{3x+1})^2$

$25 = 3x+1$

$24 = 3x$

$8 = x$

Solve the equation. Check for extraneous solutions.

18) $\frac{1}{2}x = \sqrt{2x-3}$

$\left(\frac{1}{2}x\right)^2 = \left(\sqrt{2x-3}\right)^2$

$\left(\frac{1}{4}x^2 = 2x-3\right) \cdot 4$

$x^2 = 8x-12$

$x^2-8x+12=0$

$(x-6)(x-2)=0$

$x = 6$ and 2

Solve the equation. Check for extraneous solutions.

19) $\sqrt{18-2x}+5=x$

$\sqrt{18-2x}=x-5$

$\left(\sqrt{18-2x}\right)^2=(x-5)^2$ FOIL

$18-2x=x^2-10x+25$

$0=x^2-8x+7$

$(x-7)(x-1)=0$

$x=7$ and 1 Only 7 is a solution.