Name: _____ Period: _____ Date: _____

Solving Radical Equations Assignment

Solve the following radical equation.

1. $\sqrt{x} = 3$ Checking solution:

2. $2\sqrt{x} = 12$ Checking solution:

3. $\sqrt{x} = 4$ Checking solution:

Solve the following radical equation.

4. $\sqrt{x+3} = 7$ Checking solution:

5. $\sqrt{2y+1} = 19$ Checking solution:

6. $\sqrt{3x+1} + 5 = 19$ Checking solution:

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Solving Radical Equations Assignment

7. $x = \sqrt{x+2}$ Checking solution:

8. $\sqrt{x-2} = 2 - x$ Checking solution:

9. $x - 1 = \sqrt{5x-9}$ Checking solution:

Solve the following radical equation.

10. $\sqrt{2x-1} + 5 = 2$ Checking solution:

11. $\sqrt{2x+3} = \sqrt{x+2}$ Checking solution:

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Solving Radical Equations Assignment

12. $\sqrt{11-2x}=\sqrt{x-1}$ Checking solution:

13. $2\sqrt{x+8}=3\sqrt{x-2}$ Checking solution:

14. $(4x+1)^{\frac{1}{2}}+2=5$ Checking solution:

15. $x=\frac{\sqrt{10x+3}}{5}$ Checking solution:

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Solving Radical Equations Assignment

ANSWERS

Solve the following radical equation.

1. $\sqrt{x} = 3$
$(\sqrt{x})^2 = 3^2$
$x = 9$

Checking solution:
$x = 9$
$\sqrt{9} = 3$
$3 = 3$
$x = 9$ is a solution of this equation
$\{9\}$

2. $2\sqrt{x} = 12$
$(2\sqrt{x})^2 = 12^2$
$4x = 144$
$x = 36$

Checking solution:
$x = 36$
$2\sqrt{36} = 12$
$12 = 12$
$x = 36$ is a solution of this equation
$\{36\}$

3. $\sqrt{x} = 4$
$(\sqrt{x})^2 = 4^2$
$x = 16$

Checking solution:
$x = 16$
$\sqrt{16} = 4$
$4 = 4$
$x = 16$ is a solution of this equation
$\{16\}$

Solve the following radical equation.

4. $\sqrt{x+3} = 7$
$(\sqrt{x+3})^2 = 7^2$
$x + 3 = 49$
$x + 3 = 49$
$x = 46$

Checking solution:
$x = 46$
$\sqrt{46+3} = 7$
$\sqrt{49} = 7$
$7 = 7$
$x = 46$ is a solution of this equation
$\{46\}$

5. $\sqrt{2y+1} = 19$
$(\sqrt{2y+1})^2 = 19^2$
$2y + 1 = 361$
$2y = 361 - 1$
$2y = 360$
$y = 180$

Checking solution:
$y = 180$
$\sqrt{2 * 180 + 1} = 19$
$\sqrt{361} = 19$
$19 = 19$
$y = 180$ is a solution of this equation
$\{180\}$

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Solving Radical Equations Assignment

6. $\sqrt{3x+1}+5=19$

$\sqrt{3x+1}=14$

$\left(\sqrt{3x+1}\right)^2=(14)^2$

$3x+1=196$

$3x=196-1$

$3x=195$

$x=65$

Checking solution:

$x=65$

$\sqrt{3*65+1}+5=19$

$\sqrt{195+1}=14$

$\sqrt{196}=14$

$14=14$

$x=65$ is a solution of this equation

$\{65\}$

7. $x=\sqrt{x+2}$

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

$x^2=x+2$

$x^2-x-2=0$

$(x-2)(x+1)=0$

$x_1=2$

$x_2=-1$

Checking solution:

$x_1=2$

$2=\sqrt{2+2}$

$2=\sqrt{4}$

$2=2$

$x_1=2$ is a solution of this equation

$x_2=-1$

$-1=\sqrt{-1+2}$

$-1=\sqrt{1}$

$-1\neq 1$

$x_2=-1$ is an extraneous solution of this equation

$\{2\}$

8. $\sqrt{x-2}=2-x$

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

$x-2=4-4x+x^2$

$x^2-5x+6=0$

$(x-2)(x-3)=0$

$x_1=2$

$x_2=3$

Checking solution:

$x_1=2$

$\sqrt{2-2}=2-2$

$0=0$

$x_1=2$ is a solution of this equation

$x_2=3$

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

$1\neq -1$

$x_2=3$ is an extraneous solution of this equation

$\{2\}$

9. $x-1=\sqrt{5x-9}$

$(x-1)^2=\left(\sqrt{5x-9}\right)^2$

$x^2-2x+1=5x-9$

$x^2-7x+10=0$

$(x-5)(x-2)=0$

$x_1=5$

$x_2=2$

Checking solution:

$x_1=5$

$5-1=\sqrt{5*5-9}$

$4=\sqrt{16}$

$4=4$

$x_1=5$ is a solution of this equation

$x_2=2$

$2-1=\sqrt{5*2-9}$

$1=1$

$x_2=2$ is a solution of this equation

$\{5,2\}$

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Solving Radical Equations Assignment

Solve the following radical equation.

10. $\sqrt{2x-1}+5=2$

$\sqrt{2x-1}=2-5$

$\sqrt{2x-1}=-3$

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

$2x-1=9$

$2x=10$

$x=5$

Checking solution:

$x=5$

$\sqrt{2*5-1}+5=2$

$\sqrt{9}+5=2$

$8\neq 2$

$x=5$ is an extraneous solution of this equation

$\emptyset$

11. $\sqrt{2x+3}=\sqrt{x+2}$

$\left(\sqrt{2x+3}\right)^2=\left(\sqrt{x+2}\right)^2$

$2x+3=x+2$

$x=-1$

Checking solution:

$x=-1$

$\sqrt{2*(-1)+3}=\sqrt{-1+2}$

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

$1=1$

$x=-1$ is a solution of this equation

$\{-1\}$

12. $\sqrt{11-2x}=\sqrt{x-1}$

$\left(\sqrt{11-2x}\right)^2=\left(\sqrt{x-1}\right)^2$

$11-2x=x-1$

$3x=12$

$x=4$

Checking solution:

$x=4$

$\sqrt{11-2*4}=\sqrt{4-1}$

$\sqrt{3}=\sqrt{3}$

$x=4$ is a solution of this equation

$\{4\}$

13. $2\sqrt{x+8}=3\sqrt{x-2}$

$2^2\left(\sqrt{x+8}\right)^2=3^2\left(\sqrt{x-2}\right)^2$

$4(x+8)=9(x-2)$

$4x+32=9x-18$

$5x=50$

$x=10$

Checking solution:

$x=10$

$2\sqrt{10+8}=3\sqrt{10-2}$

$2\sqrt{18}=3\sqrt{8}$

$6\sqrt{2}=6\sqrt{2}$

$x=10$ is a solution of this equation

$\{10\}$

14. $(4x+1)^{\frac{1}{2}}+2=5$

$\sqrt{4x+1}=5-2$

$\sqrt{4x+1}=3$

$\left(\sqrt{4x+1}\right)^2=3^2$

$4x+1=9$

$4x=8$

$x=2$

Checking solution:

$x=2$

$\sqrt{4*2+1}=3$

$\sqrt{9}=3$

$3=3$

$x=2$ is a solution of this equation

$\{2\}$

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Solving Radical Equations Assignment

15.

$$x = \frac{\sqrt{10x+3}}{5}$$
$$5x = \sqrt{10x+3}$$
$$(5x)^2 = \left(\sqrt{10x+3}\right)^2$$
$$25x^2 = 10x + 3$$
$$25x^2 - 10x - 3 = 0$$
$$(5x-3)(5x+1) = 0$$
$$x_1 = \frac{3}{5}$$

$$x_2 = -\frac{1}{5}$$

Checking solution:

$$x_1 = \frac{3}{5}$$

$$\frac{3}{5} = \frac{\sqrt{10\frac{3}{5}+3}}{5}$$

$$\frac{3}{5} = \frac{3}{5}$$

$x_1 = \frac{3}{5}$ is a solution of this equation

$$x_2 = -\frac{1}{5}$$

$$-\frac{1}{5} = \frac{\sqrt{10 * \left(-\frac{1}{5}\right)+3}}{5}$$

$$-\frac{1}{5} \neq \frac{1}{5}$$

$x_2 = -\frac{1}{5}$ is an extraneous solution of this equation

$\left\{\frac{3}{5}\right\}$