ANSWER PRESENTATION TOOL

Algebra 2 - Student Edit 5 4 - Practice 2-46 ALL EVEN Show Solı

ODD

2. $\sqrt{3x+10} = 8$

$(\sqrt{3x+10})^2 = 8^2$

$3x + 10 = 64$

$3x = 54$

$x = 18$

Check: $\sqrt{3(18)+10} \stackrel{?}{=} 8$

$\sqrt{64} \stackrel{?}{=} 8$

$8 = 8$ ✓

The solution is $x = 18$.

4. $\sqrt[3]{x} - 10 = -7$

$\sqrt[3]{x} = 3$

$(\sqrt[3]{x})^3 = 3^3$

$x = 27$

Check: $\sqrt[3]{27} - 10 \stackrel{?}{=} -7$

$3 - 10 \stackrel{?}{=} -7$

$-7 = -7$ ✓

The solution is $x = 27$.

6. $\sqrt{2x} - \frac{2}{3} = 0$

$\sqrt{2x} = \frac{2}{3}$

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

$2x = \frac{4}{9}$

$x = \frac{2}{9}$

Check: $\sqrt{2\left(\frac{2}{9}\right)} - \frac{2}{3} \stackrel{?}{=} 0$

$\sqrt{\frac{4}{9}} - \frac{2}{3} \stackrel{?}{=} 0$

$\frac{2}{3} - \frac{2}{3} \stackrel{?}{=} 0$

$0 = 0$ ✓

The solution is $x = \frac{2}{9}$.

8. $\frac{1}{5}\sqrt[3]{3x} + 10 = 8$

$$\frac{1}{5}\sqrt[3]{3x} = -2$$
$$\sqrt[3]{3x} = -10$$
$$\left(\sqrt[3]{3x}\right)^3 = (-10)^3$$
$$3x = -1000$$
$$x = -\frac{1000}{3}$$

Check: $\frac{1}{5}\sqrt[3]{3\left(-\frac{1000}{3}\right)} + 10 \stackrel{?}{=} 8$

$$\frac{1}{5}\sqrt[3]{-1000} + 10 \stackrel{?}{=} 8$$
$$\frac{1}{5}(-10) + 10 \stackrel{?}{=} 8$$
$$-2 + 10 \stackrel{?}{=} 8$$
$$8 = 8 \checkmark$$

The solution is $-\frac{1000}{3}$.

10. $\sqrt[4]{4x} - 13 = -15$

$$\sqrt[4]{4x} = -2$$

The equation has no real solution.

12.

$$h = 62.5\sqrt[3]{t} + 75.8$$
$$250 = 62.5\sqrt[3]{t} + 75.8$$
$$174.2 = 62.5\sqrt[3]{t}$$
$$2.79 \approx \sqrt[3]{t}$$
$$(2.79)^3 \approx \sqrt[3]{t}^3$$
$$21.7 \approx t$$

The age of a male Asian elephant that is 250 centimeters tall is about 21.7 years.

14.

$$x - 10 = \sqrt{9x}$$
$$(x - 10)^2 = \left(\sqrt{9x}\right)^2$$
$$x^2 - 20x + 100 = 9x$$
$$x^2 - 29x + 100 = 0$$
$$(x - 4)(x - 25) = 0$$
$$x - 4 = 0 \quad \text{or} \quad x - 25 = 0$$
$$x = 4 \quad \text{or} \quad x = 25$$

Check:

$$4 - 10 \stackrel{?}{=} \sqrt{9(4)} \qquad 25 - 10 \stackrel{?}{=} \sqrt{9(25)}$$
$$-6 \stackrel{?}{=} \sqrt{36} \qquad 15 \stackrel{?}{=} \sqrt{225}$$
$$-6 \neq 6 \text{ ✗} \qquad 15 = 15 \text{ ✓}$$

The solution is $x = 25$.

16.

$$\sqrt{2x + 30} = x + 3$$
$$\left(\sqrt{2x + 30}\right)^2 = (x + 3)^2$$
$$2x + 30 = x^2 + 6x + 9$$
$$0 = x^2 + 4x - 21$$
$$0 = (x + 7)(x - 3)$$
$$x + 7 = 0 \quad \text{or} \quad x - 3 = 0$$
$$x = -7 \quad \text{or} \quad x = 3$$

Check:

$$\sqrt{2(-7) + 30} \stackrel{?}{=} -7 + 3 \qquad \sqrt{2(3) + 30} \stackrel{?}{=} 3 + 3$$
$$\sqrt{16} \stackrel{?}{=} -4 \qquad \sqrt{36} \stackrel{?}{=} 6$$
$$4 \neq -4 \text{ ✗} \qquad 6 = 6 \text{ ✓}$$

The solution is $x = 3$.

18. $\sqrt[3]{3 - 8x^2} = 2x$

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

$$3 - 8x^2 = 8x^3$$

$$0 = 8x^3 + 8x^2 - 3$$

The possible rational zeros are $\pm 1, \pm 3, \pm\frac{1}{2}, \pm\frac{3}{2}, \pm\frac{1}{4}, \pm\frac{3}{4}$.

$$\begin{array}{c|cccc} \frac{1}{2} & 8 & 8 & 0 & -3 \\ & & 4 & 6 & 3 \\ \hline & 8 & 12 & 6 & 0 \end{array}$$

So, $\frac{1}{2}$ is a zero.

$$8x^3 + 8x^2 - 3 = 0$$

$$\left(x - \frac{1}{2}\right)(8x^2 + 12x + 6) = 0$$

$$2\left(x - \frac{1}{2}\right)(4x^2 + 6x + 3) = 0$$

The quadratic equation $4x^2 + 6x + 3 = 0$ has no real solutions.

Check: $\sqrt[3]{3 - 8\left(\frac{1}{2}\right)^2} \stackrel{?}{=} 2\left(\frac{1}{2}\right)$

$$\sqrt[3]{1} \stackrel{?}{=} 1$$

$$1 = 1 \checkmark$$

20. $\sqrt{3x-3} = \sqrt{x+12}$

$$\left(\sqrt{3x-3}\right)^2 = \left(\sqrt{x+12}\right)^2$$

$$3x - 3 = x + 12$$

$$2x = 15$$

$$x = \frac{15}{2}$$

Check: $\sqrt{3\left(\frac{15}{2}\right) - 3} \stackrel{?}{=} \sqrt{\frac{15}{2} + 12}$

$$\sqrt{\frac{39}{2}} = \sqrt{\frac{39}{2}} \checkmark$$

The solution is $x = \frac{15}{2}$.

22. $\sqrt[3]{x+5} - 2\sqrt[3]{2x+6} = 0$

$$\sqrt[3]{x+5} = 2\sqrt[3]{2x+6}$$

$$\left(\sqrt[3]{x+5}\right)^3 = \left(2\sqrt[3]{2x+6}\right)^3$$

$$x + 5 = 8(2x + 6)$$

$$x + 5 = 16x + 48$$

$$-15x = 43$$

$$x = -\frac{43}{15}$$

Check: $\sqrt[3]{-\frac{43}{15} + 5} - 2\sqrt[3]{2\left(-\frac{43}{15}\right) + 6} \stackrel{?}{=} 0$

$$\sqrt[3]{\frac{32}{15}} - 2\sqrt[3]{\frac{4}{15}} \stackrel{?}{=} 0$$

$$0 = 0 \checkmark$$

The solution is $x = -\frac{43}{15}$.

24. $4x^{3/2} = 32$

$x^{3/2} = 8$

$(x^{3/2})^{2/3} = 8^{2/3}$

$x = 4$

Check: $4(4)^{3/2} \stackrel{?}{=} 32$

$4 \bullet 8 \stackrel{?}{=} 32$

$32 = 32$ ✓

The solution is $x = 4$.

26. $2x^{3/4} - 14 = 40$

$2x^{3/4} = 54$

$x^{3/4} = 27$

$(x^{3/4})^{4/3} = 27^{4/3}$

$x = 81$

Check:

$2(81)^{3/4} - 14 \stackrel{?}{=} 40$

$2(27) - 14 \stackrel{?}{=} 40$

$40 = 40$ ✓

The solution is $x = 81$.

28. $(5 - x)^{1/2} - 2x = 0$

$(5 - x)^{1/2} = 2x$

$\left[(5 - x)^{1/2}\right]^2 = (2x)^2$

$5 - x = 4x^2$

$0 = 4x^2 + x - 5$

$0 = (x - 1)(4x + 5)$

$x - 1 = 0$ or $4x + 5 = 0$

$x = 1$ or $x = -\frac{5}{4}$

Check:

$(5 - 1)^{1/2} - 2(1) \stackrel{?}{=} 0$

$4^{1/2} - 2 \stackrel{?}{=} 0$

$2 - 2 \stackrel{?}{=} 0$

$0 = 0$ ✓

$\left(5 - \left(-\frac{5}{4}\right)\right)^{1/2} - 2\left(-\frac{5}{4}\right) \stackrel{?}{=} 0$

$\left(\frac{25}{4}\right)^{1/2} + \frac{5}{2} \stackrel{?}{=} 0$

$\frac{5}{2} + \frac{5}{2} \stackrel{?}{=} 0$

$5 \neq 0$ ✗

The solution is $x = 1$.

30. $(5x^2 - 4)^{1/4} = x$

$$\left[(5x^2 - 4)^{1/4}\right]^4 = x^4$$

$$5x^2 - 4 = x^4$$

$$0 = x^4 - 5x^2 + 4$$

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

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

$x + 1 = 0$ or $x - 1 = 0$

$x = -1$ or $x = 1$

or

$x + 2 = 0$ or $x - 2 = 0$

$x = -2$ or $x = 2$

Check:

$\left[5(-1)^2 - 4\right]^{1/4} \stackrel{?}{=} -1$

$1^{1/4} \stackrel{?}{=} -1$

$1 \neq -1$ ✗

$\left[5(1)^2 - 4\right]^{1/4} \stackrel{?}{=} 1$

$1^{1/4} \stackrel{?}{=} 1$

$1 = 1$ ✓

$\left[5(-2)^2 - 4\right]^{1/4} \stackrel{?}{=} -2$

$16^{1/4} \stackrel{?}{=} -2$

$2 \neq -2$ ✗

$\left[5(2)^2 - 4\right]^{1/4} \stackrel{?}{=} 2$

$16^{1/4} \stackrel{?}{=} 2$

$2 = 2$ ✓

The solutions are $x = 1$ and $x = 2$.

32. When raising each side to an exponent, the 8 was not included.

$$8x^{3/2} = 1000$$
$$(8x^{3/2})^{2/3} = 1000^{2/3}$$
$$4x = 100$$
$$x = 25$$

34. Solve for x.

$$7\sqrt{x} + 1 < 9$$
$$7\sqrt{x} < 8$$
$$\sqrt{x} < \frac{8}{7}$$
$$x < \frac{64}{49}$$

Consider the radicand.

$x \geq 0$

So, the solution is $0 \leq x < \frac{64}{49}$.

36. $\sqrt[3]{x-4} \leq 5$

$$\left(\sqrt[3]{x-4}\right)^3 \leq 5^3$$
$$x - 4 \leq 125$$
$$x \leq 129$$

The solution is $x \leq 129$.

38. $-2\sqrt[3]{x+4} < 12$

$\sqrt[3]{x+4} > -6$

$\left(\sqrt[3]{x+4}\right)^3 > (-6)^3$

$x + 4 > -216$

$x > -220$

So, the solution is $x > -220$.

40. Solve for x.

$-0.25\sqrt{x} - 6 \leq -3$

$0.25\sqrt{x} \leq 3$

$\sqrt{x} \geq -12$

Consider the radicand.

$x \geq 0$

So, the solution is $x \geq 0$.

42. If the price is raised, then the demand on the number of units will decrease.

44. Substitute $x + 5$ for y in Equation 1 and solve for x.

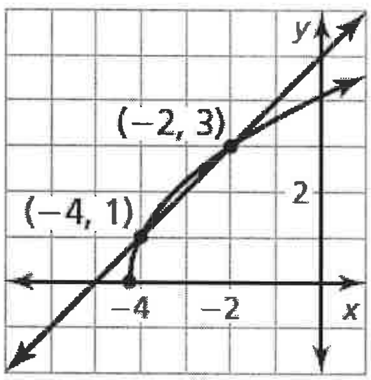
$$x + 5 = \sqrt{4x + 17}$$
$$(x + 5)^2 = 4x + 17$$
$$x^2 + 10x + 25 = 4x + 17$$
$$x^2 + 6x + 8 = 0$$
$$(x + 2)(x + 4) = 0$$
$$x + 2 = 0 \quad \text{or} \quad x + 4 = 0$$
$$x = -2 \quad \text{or} \quad x = -4$$

Substitute the values for x into Equation 2 and solve for y.

$x = -2$: $y = -2 + 5$ $\qquad$ $x = -4$: $y = -4 + 5$

$y = 3$ $\qquad$ $y = 1$

The solutions are $(-2, 3)$ and $(-4, 1)$.



46. $(-2, 0)$, $\left(1, \sqrt{3}\right)$, and $\left(1, -\sqrt{3}\right)$;