ANSWER PRESENTATION TOOL

Algebra 2 - Student Edit 5 4 - Practice 1-45 ALL EVEN ODD Show Solı

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

$(\sqrt{5x+1})^2 = 6^2$

$5x + 1 = 36$

$5x = 35$

$x = 7$

Check: $\sqrt{5(7)+1} \stackrel{?}{=} 6$

$\sqrt{36} \stackrel{?}{=} 6$

$6 = 6$ ✓

The solution is $x = 7$.

3. $\sqrt[3]{x-16} = 2$

$(\sqrt[3]{x-16})^3 = 2^3$

$x - 16 = 8$

$x = 24$

Check: $\sqrt[3]{24-16} \stackrel{?}{=} 2$

$\sqrt[3]{8} \stackrel{?}{=} 2$

$2 = 2$ ✓

The solution is $x = 24$.

5. $-2\sqrt{24x} + 13 = -11$

$-2\sqrt{24x} = -24$

$\sqrt{24x} = 12$

$(\sqrt{24x})^2 = 12^2$

$24x = 144$

$x = 6$

Check:

$-2\sqrt{24(6)} + 13 \stackrel{?}{=} -11$

$-2\sqrt{144} + 13 \stackrel{?}{=} -11$

$-2(12) + 13 \stackrel{?}{=} -11$

$-24 + 13 \stackrel{?}{=} -11$

$-11 = -11$ ✓

The solution is $x = 6$.

7. $8\sqrt[3]{10x} - 15 = 17$

$8\sqrt[3]{10x} = 32$

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

$(\sqrt[3]{10x})^3 = 4^3$

$10x = 64$

$x = 6.4$

Check: $8\sqrt[3]{10\left(\frac{64}{10}\right)} - 15 \stackrel{?}{=} 17$

$8\sqrt[3]{64} - 15 \stackrel{?}{=} 17$

$8 \cdot 4 - 15 \stackrel{?}{=} 17$

$32 - 15 \stackrel{?}{=} 17$

$17 = 17$ ✓

The solution is $x = 6.4$.

9. $2\sqrt[5]{x} + 7 = 15$

$2\sqrt[5]{x} = 8$

$\sqrt[5]{x} = 4$

$(\sqrt[5]{x})^5 = 4^5$

$x = 1024$

Check: $2\sqrt[5]{1024} + 7 \stackrel{?}{=} 15$

$2 \cdot 4 + 7 \stackrel{?}{=} 15$

$15 = 15$ ✓

The solution is $x = 1024$.

11. $v = \sqrt{2gh}$

$7 \approx \sqrt{2 \cdot 9.8h}$

$7 \approx \sqrt{19.6h}$

$7^2 \approx (\sqrt{19.6h})^2$

$49 \approx 19.6h$

$2.5 \approx h$

The height of the swing path is about 2.5 meters.

13.

$$x - 6 = \sqrt{3x}$$

$$(x - 6)^2 = \left(\sqrt{3x}\right)^2$$

$$x^2 - 12x + 36 = 3x$$

$$x^2 - 15x + 36 = 0$$

$$(x - 12)(x - 3) = 0$$

$$x - 12 = 0 \quad \text{or} \quad x - 3 = 0$$

$$x = 12 \quad \text{or} \quad x = 3$$

Check:

$$12 - 6 \stackrel{?}{=} \sqrt{3(12)} \qquad 3 - 6 \stackrel{?}{=} \sqrt{3(3)}$$

$$6 \stackrel{?}{=} \sqrt{36} \qquad -3 \stackrel{?}{=} \sqrt{9}$$

$$6 = 6 \checkmark \qquad -3 \neq 3 \times$$

The solution is $x = 12$.

15. $\sqrt{44 - 2x} = x - 10$

$$\left(\sqrt{44 - 2x}\right)^2 = (x - 10)^2$$

$$44 - 2x = x^2 - 20x + 100$$

$$0 = x^2 - 18x + 56$$

$$0 = (x - 4)(x - 14)$$

$$x - 4 = 0 \quad \text{or} \quad x - 14 = 0$$

$$x = 4 \quad \text{or} \quad x = 14$$

Check:

$$\sqrt{44 - 2(4)} \stackrel{?}{=} 4 - 10$$

$$\sqrt{36} \stackrel{?}{=} -6$$

$$6 \neq -6 \text{ ✗}$$

$$\sqrt{44 - 2(14)} \stackrel{?}{=} 14 - 10$$

$$\sqrt{16} \stackrel{?}{=} 4$$

$$4 = 4 \text{ ✓}$$

The solution is $x = 14$.

17. $\sqrt[3]{2x^3 - 1} = x$

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

$$2x^3 - 1 = x^3$$

$$x^3 = 1$$

$$\sqrt[3]{x^3} = \sqrt[3]{1}$$

$$x = 1$$

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

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

$$1 = 1$$

The solution is $x = 1$.

19. $\sqrt{4x + 1} = \sqrt{x + 10}$

$$\left(\sqrt{4x + 1}\right)^2 = \left(\sqrt{x + 10}\right)^2$$

$$4x + 1 = x + 10$$

$$3x = 9$$

$$x = 3$$

Check:

$$\sqrt{4(3) + 1} \stackrel{?}{=} \sqrt{3 + 10}$$

$$\sqrt{13} = \sqrt{13} \checkmark$$

The solution is $x = 3$.

21. $\sqrt[3]{2x-5} - \sqrt[3]{8x+1} = 0$

$$\sqrt[3]{2x-5} = \sqrt[3]{8x+1}$$

$$\left(\sqrt[3]{2x-5}\right)^3 = \left(\sqrt[3]{8x+1}\right)^3$$

$$2x - 5 = 8x + 1$$

$$-6x = 6$$

$$x = -1$$

Check: $\sqrt[3]{2(-1)-5} - \sqrt[3]{8(-1)+1} \stackrel{?}{=} 0$

$$\sqrt[3]{-7} - \sqrt[3]{-7} \stackrel{?}{=} 0$$

$$0 = 0 \checkmark$$

The solution is $x = -1$.

23. $2x^{2/3} = 8$

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

$$(x^{2/3})^{3/2} = 4^{3/2}$$

$$x = \pm 8$$

Check:

$2(8)^{2/3} \stackrel{?}{=} 8$ $\quad$ $2(-8)^{2/3} \stackrel{?}{=} 8$

$2 \cdot 4 \stackrel{?}{=} 8$ $\quad$ $2 \cdot 4 \stackrel{?}{=} 8$

$8 = 8 \checkmark$ $\quad$ $8 = 8 \checkmark$

The solutions are $x = \pm 8$.

25. $x^{1/4} + 3 = 0$

$$x^{1/4} = -3$$

$$(x^{1/4})^4 = (-3)^4$$

$$x = 81$$

Check: $81^{1/4} + 3 \stackrel{?}{=} 0$

$$3 + 3 \stackrel{?}{=} 0$$

$$6 \neq 0 \text{ ✗}$$

The equation has no real solution.

27. $(x + 6)^{1/2} = x$

$$\left[(x + 6)^{1/2}\right]^2 = x^2$$

$$x + 6 = x^2$$

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

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

$$x - 3 = 0 \quad \text{or} \quad x + 2 = 0$$

$$x = 3 \quad \text{or} \quad x = -2$$

Check:

$$(3 + 6)^{1/2} \stackrel{?}{=} 3 \qquad (-2 + 6)^{1/2} \stackrel{?}{=} -2$$

$$9^{1/2} \stackrel{?}{=} 3 \qquad 4^{1/2} \stackrel{?}{=} -2$$

$$3 = 3 \checkmark \qquad 2 \neq -2 \times$$

The solution is $x = 3$.

29.

$$2(x + 11)^{1/2} = x + 3$$
$$\left[2(x + 11)^{1/2}\right]^2 = (x + 3)^2$$
$$4(x + 11) = x^2 + 6x + 9$$
$$4x + 44 = x^2 + 6x + 9$$
$$0 = x^2 + 2x - 35$$
$$0 = (x + 7)(x - 5)$$
$$x + 7 = 0 \quad \text{or} \quad x - 5 = 0$$
$$x = -7 \quad \text{or} \quad x = 5$$

Check:

$$2(-7 + 11)^{1/2} \stackrel{?}{=} -7 + 3 \qquad 2(5 + 11)^{1/2} \stackrel{?}{=} 5 + 3$$
$$2(4)^{1/2} \stackrel{?}{=} -4 \qquad 2(16)^{1/2} \stackrel{?}{=} 8$$
$$2 \cdot 2 \stackrel{?}{=} -4 \qquad 2(4) \stackrel{?}{=} 8$$
$$4 \neq -4 \ ✗ \qquad 8 = 8 \ ✓$$

The solution is $x = 5$.

31. The right-hand side was not cubed.

$$\sqrt[3]{3x - 8} = 4$$
$$\left(\sqrt[3]{3x - 8}\right)^3 = 4^3$$
$$3x - 8 = 64$$
$$3x = 72$$
$$x = 24$$

33. Solve for x.

$$4\sqrt{x} - 2 > 18$$
$$4\sqrt{x} > 20$$
$$\sqrt{x} > 5$$
$$x > 25$$

Consider the radicand.

$x \geq 0$

So, the solution is $x > 25$.

35. $\sqrt[3]{x-5} \geq 3$

$$\left(\sqrt[3]{x-5}\right)^3 \geq 3^3$$
$$x - 5 \geq 27$$
$$x \geq 32$$

The solution is $x \geq 32$.

37. $4\sqrt[3]{x+7} \geq 8$

$$\sqrt[3]{x+7} \geq 2$$
$$\left(\sqrt[3]{x+7}\right)^3 \geq 2^3$$
$$x + 7 \geq 8$$
$$x \geq 1$$

So, the solution is $x \geq 1$.

39. Solve for x.

$$2\sqrt{x} + 3 \leq 8$$
$$2\sqrt{x} \leq 5$$
$$\sqrt{x} \leq \frac{5}{2}$$
$$x \leq \frac{25}{4}$$

Consider the radicand.

$$x \geq 0$$

So, the solution is $0 \leq x \leq \frac{25}{4}$.

41.

$$n = \sqrt{\frac{T}{0.0054}}$$
$$196 = \sqrt{\frac{T}{0.0054}}$$
$$196^2 = \left(\sqrt{\frac{T}{0.0054}}\right)^2$$
$$38{,}416 = \frac{T}{0.0054}$$
$$207.4464 = T$$

The tension of the string is 207.4464 newtons.

43. Substitute y for $x - 3$ in Equation 1 and solve for y.

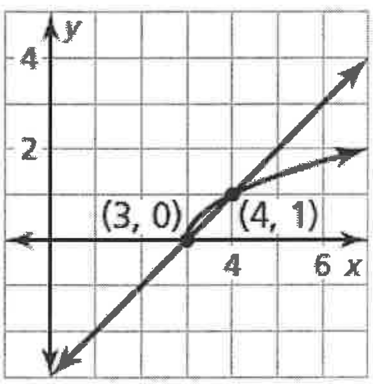
$$y = \sqrt{y}$$
$$y^2 = y$$
$$y^2 - y = 0$$
$$y(y - 1) = 0$$
$$y = 0 \quad \text{or} \quad y - 1 = 0$$
$$y = 0 \quad \text{or} \quad y = 1$$

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

$y = 0$: $0 = x - 3$ $\qquad$ $y = 1$: $1 = x - 3$

$3 = x$ $\qquad$ $4 = x$

The solutions are (3, 0) and (4, 1).



45. Substitute $\frac{1}{2}x^2 - 1$ for y in Equation 1 and solve for x.

$$\frac{1}{2}x^2 - 1 = \pm\sqrt{-x^2 + 1}$$

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

$$\frac{1}{4}x^4 - x^2 + 1 = -x^2 + 1$$

$$\frac{1}{4}x^4 = 0$$

$$x = 0$$

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

$$y = \frac{1}{2}(0)^2 - 1$$

$$y = -1$$

The solution is $(0, -1)$.