

Key

### Unit 5 (A.REI.A – radical) Review

Solve each equation. Show all required work. Check for and identify any extraneous solutions.

1)  $x = \sqrt{10x - 24}$

$$x^2 = 10x - 24$$

$$x^2 - 10x + 24 = 0$$

$$(x - 4)(x - 6) = 0$$

$$x - 4 = 0 \quad x - 6 = 0$$

$$x = 4 \quad x = 6$$

$$4 = \sqrt{10(4) - 24} \quad 6 = \sqrt{10(6) - 24}$$

$$4 = \sqrt{16} \quad 6 = \sqrt{36}$$

$$4 = 4 \quad 6 = 6$$

Answer(s):  $x = 4, x = 6$

2)  $5 \cdot \sqrt[3]{3x + 5} = -35$

$$\left(\sqrt[3]{3x + 5}\right)^3 = (-7)^3$$

$$3x + 5 = -343$$

$$3x = -348$$

$$x = -116$$

$$5 \cdot \sqrt[3]{3(-116) + 5} = -35$$

$$5 \cdot \sqrt[3]{-343} = -35$$

$$5 \cdot -7 = -35$$

$$-35 = -35$$

Answer(s):  $x = -116$

3)  $\sqrt[4]{x} + 48 = 43$

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

$$x = 625$$

$$\sqrt[4]{625} + 48 = 43$$

$$5 + 48 = 43$$

$$53 = 43$$

$$x$$

Answer(s): no solution

4) A formula showing how to calculate the radius of a sphere based on its volume is

$$\sqrt[3]{\frac{3V}{4\pi}} = r$$

Show how to use this formula to calculate the volume of a sphere with a radius of 8 cm. Leave your answer in terms of  $\pi$  (not converting  $\pi$  to a decimal). Don't forget your units!

$$\left(\sqrt[3]{\frac{3V}{4\pi}}\right)^3 = (8 \text{ cm})^3$$

$$\frac{4\pi}{3} \cdot \frac{3V}{4\pi} = 512 \cdot \frac{4\pi}{3}$$

Answer:  $V = \frac{2048\pi}{3} \text{ cm}^3$

Exemplary:

5) Solve each equation. Show all required work. Show your check.

$$(x + 2)^2 = \sqrt{40 - x}$$

$$x^2 + 4x + 4 = 40 - x$$

$$x^2 + 5x - 36 = 0$$

$$(x - 4)(x + 9) = 0$$

$$x - 4 = 0$$

$$x + 9 = 0$$

$$x = 4$$

~~$x = -9$~~  extraneous

$$4 + 2 = \sqrt{40 - 4}$$

$$-9 + 2 = \sqrt{40 - 9}$$

$$6 = \sqrt{36}$$

$$-7 = \sqrt{49}$$

$$6 = 6$$

$$-7 = 7$$

✓

x