

§ 7.6 #s 1, 5, 9, ..., 65.  
Also do # 19.

Questions?

#s 21, 61  
Rationalize the denominator.

$$\frac{\sqrt[3]{2}}{\sqrt[3]{5}} = \frac{\sqrt[3]{2}}{\sqrt[3]{5}} \cdot \frac{\sqrt[3]{5^2}}{\sqrt[3]{5^2}} = \frac{\sqrt[3]{50}}{5}$$

$$\begin{aligned} \sqrt[3]{5} \sqrt[3]{5^2} &= \\ \sqrt[3]{5^3} &= 5 \\ \sqrt[3]{2} \sqrt[3]{25} &= \sqrt[3]{50} \end{aligned}$$

Rationalize the numerator:

$$\frac{\sqrt[3]{7}}{9} = \frac{\sqrt[3]{7}}{9} \cdot \frac{\sqrt[3]{7^2}}{\sqrt[3]{7^2}} = \frac{7}{9\sqrt[3]{49}}$$



## §7.6 Radical Equations

Squaring both sides of an equation doesn't lose any solutions.

$$A = B \Rightarrow A^2 = B^2$$

$$\Rightarrow A = B$$

NOT

$$(-3)^2 = 3^2$$

$$-3 \neq 3$$

We're casting a net.

We catch every thing we need, and a few things we don't need.

Extraneous Solutions - throw 'em back.

$$\sqrt{3x-2} = 5$$

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

$$3x-2 = 25$$

$$+2 = +2$$

$$3x = 27$$

Square both sides to extract 'x' from inside the radical.

Check:  $x = \frac{27}{3} = \boxed{9 = x}$

Sol'n Set

$$\boxed{\{9\}}$$

$$\sqrt{3(9)-2} = 5 ?$$

$$\sqrt{27-2} = 5 ?$$

$$\sqrt{25} = 5 \checkmark$$

$$|9x-2| - 2x = 0$$

$$+ 2x = 2x$$

$$|9x-2| = 2x$$

$$9x-2 = 2x$$

Chapter 2

OR

$$9x-2 = -2x$$

etc.

$$\sqrt{9x-2} - 2x = 0$$

$$+ 2x = 2x$$

1st Isolate the (ugly) radical.

$$\sqrt{9x-2} = 2x$$

$$\left(\sqrt{9x-2}\right)^2 = (2x)^2 = 2^2 x^2 = 4x^2$$

$$9x-2 = 4x^2$$

$$- 9x + 2 = - 9x + 2$$

$$0 = 4x^2 - 9x + 2$$

$$4x^2 - 9x + 2 = 0$$

$(4)(2) = 8$   
 want factors of +8 that add up to -9.

$$(-8)(-1) = 8$$

$$-8 - 1 = -9$$

$$4x^2 - 8x - 1x + 2$$

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

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

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

$$x=2 \text{ OR } x = \frac{1}{4}$$

I think both check out.

$$\sqrt{9\left(\frac{1}{4}\right) - 2} - 2\left(\frac{1}{4}\right) = 0?$$

$$\sqrt{\frac{9}{4} - \frac{8}{4}} - \frac{1}{2} = 0?$$

$$\sqrt{\frac{1}{4}} - \frac{1}{2} = 0$$

$$\frac{1}{2} - \frac{1}{2} = 0 \checkmark$$

$$\frac{-8x}{+4x} = -2$$

$$\frac{-x}{-1} = x$$

$$\frac{2}{-1} = -2$$

$$2 \cdot \frac{4}{4} = \frac{2}{1} \cdot \frac{4}{4}$$

$$= \frac{8}{4}$$

$$\sqrt{\frac{1}{4}} = \frac{\sqrt{1}}{\sqrt{4}} = \frac{1}{2}$$

$$(x-3)^2 = x^2 - 2(3x) + 9 = x^2 - 6x + 9$$

$$(x+3)^2 = x^2 + 6x + 9$$

$$(x+7)^2 = x^2 + 14x + 49$$

$$(x-7)^2 = x^2 - 14x + 49$$

$$(a-b)^2 = a^2 - 2ab + b^2$$

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$(a-b)(a+b) = a^2 - b^2$$

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

$$\begin{array}{r} x+9 = x^2+6x+9 \\ -x-9 = \quad \quad -x-9 \\ \hline \end{array}$$

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

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

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

$$x > 0$$

OR

$$\begin{array}{l} x+5=0 \\ x=-5 \end{array}$$

→ Nope

check

$$\sqrt{0+9} = 0+3?$$

$$\sqrt{9} = 3?$$

$$3 = 3 \checkmark$$

$$\sqrt{-5+9} = -5+3?$$

$$\sqrt{4} = -2?$$

$$2 = -2?$$

No

$$\{0\}$$