Questions 7.5 #21, 61,

(21) $\sqrt[3]{\frac{3}{5}} = \frac{\sqrt[3]{3}}{\sqrt[3]{5}} \cdot \frac{\sqrt[3]{5^2}}{\sqrt[3]{5^2}} = \frac{\sqrt[3]{75}}{5}$

Rationalize the Numerator.

$3 \cdot 5^2 = 3 \cdot 25 = 75$

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

(61) $\sqrt[3]{\frac{7}{8}} = \frac{\sqrt[3]{7}}{\sqrt[3]{8}} = \frac{\sqrt[3]{7}}{2} \cdot \frac{\sqrt[3]{7^2}}{\sqrt[3]{7^2}}$

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

How about the "Plus one" problem?

$$\frac{\sqrt{x+h} - \sqrt{x}}{h} = ?$$

§ 7.6 Radical Equations

Squaring both sides doesn't lose any solutions (but it may introduce extraneous solutions).

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

↳ Casting a net.

NOT $\Rightarrow A = B$

$(-3)^2 = 3^2$, but $-3 \neq 3$

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

Want to extract 'x' from the radical.

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

$3x - 2 = 25$

$+2 = +2$

$3x = 27$

$x = \frac{27}{3} = 9$

$x = 9$

$\{9\}$

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

1st, isolate the radical. Then square.

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

$|9x-2| = 2x$

} similar to Chapter 2, Test 1 & absolute values.

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

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

$9x-2 = 4x^2$

$-4x^2 \quad = -4x^2$

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

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

Factors of $(4)(2) = 8$ that add up to -9

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

$-1-8 = -9$

$4x^2 - 1x - 8x + 2 = 0$

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

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

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

$-8x + 2$

$= -2\left(\frac{-8x}{-2} + \frac{2}{-2}\right)$

$= -2(4x-1)$

$4x-1=0$ OR $x-2=0$

$4x=1$ $x=2$

$x=\frac{1}{4}$ $\left\{\frac{1}{4}, 2\right\}$

Check

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

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

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

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

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

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

$=\frac{8}{4}$

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

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

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

$\sqrt{9(2)-2}-2(2)=0$?

$\sqrt{18-2}-4=0$?

$\sqrt{16}-4=0$?

$4-4=0$ ✓ 2 ✓

$\left\{\frac{1}{4}, 2\right\}$

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$(x+2)^2 = x^2 + 2(2x) + 4$

$= x^2+4x+4$

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

$(a+b)^2 =$

$a^2+2ab+b^2$

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

$\sqrt{x+9} = x+3$

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

$x+9 = x^2+6x+9$

$-x-9 = -x-9$

$0 = x^2+5x$

$x^2+5x=0$

$x(x+5)=0$

$x=0$ OR $x=-5$

5.7.6 #5 1, 5, 9, 13, 17, 19, 21, 25, 29, 33, 37, 41, 45, 49, 53, 57, 61, 65

$\sqrt{x+9} = x+3$

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

$\sqrt{9} = 3$ ✓ 0 ✓

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

$\sqrt{4} = -2$

$2 = -2$ No

-5 No

$\{0\}$

Nov 15-9:56 AM