

$$13. d = \sqrt[3]{25n^2}$$

Mercury

$$d = \sqrt[3]{25(88)^2}$$

$$d = \sqrt[3]{193600}$$

$$d = \sqrt[3]{12390400} - \sqrt[3]{193600}$$

$$d = \sqrt[3]{4096 \cdot 3025} - \sqrt[3]{64 \cdot 3025}$$

$$d = 16 \sqrt[3]{3025} - 4 \sqrt[3]{3025}$$

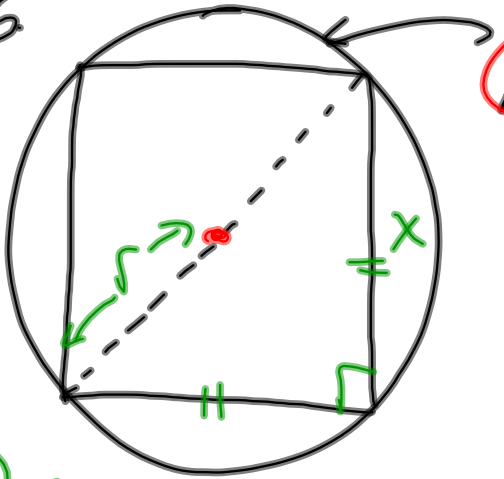
$$d = 12 \sqrt[3]{3025}$$

Mars

$$d = \sqrt[3]{25(70)^2}$$

$$d = \sqrt[3]{12390400}$$

15



$$A = 38\pi \text{ m}^2$$

$$A = \pi r^2$$

$$\frac{38\pi}{\pi} = \frac{\pi r^2}{\pi}$$

$$r^2 = 38$$

$$r = \sqrt{38}$$

(a)

$$\text{diagonal} = 2\sqrt{38}$$

$$(b) \quad x^2 + x^2 = (2\sqrt{38})^2$$

$$\frac{2x^2}{2} = \frac{152}{2}$$

$$x^2 = 76$$

$$x = \sqrt{76}$$

$$x = 2\sqrt{19}$$

$$\Rightarrow P = 4(2\sqrt{19})$$

$$= 8\sqrt{19}$$

$$10.d) \frac{w}{5} \sqrt[3]{-64} + \frac{\sqrt[3]{512w^3}}{5} - \frac{2}{5} \sqrt{50w} - 4\sqrt{2w}$$

$$= \frac{w}{5} (-4) + \frac{1}{5} (8w) - \frac{2(5)}{5} \sqrt{2w} - 4\sqrt{2w}$$

$$= -\frac{4}{5}w + \frac{8}{5}w - 2\sqrt{2w} - 4\sqrt{2w}$$

$$= \frac{4}{5}w - 6\sqrt{2w}$$

Check-Up...

Simplify:

$$\begin{aligned} & 3\sqrt{20} - 5a\sqrt[3]{40a^7} - \sqrt{125} + a^3\sqrt[3]{320a} \\ &= 3(2\sqrt{5}) - 5a\sqrt[3]{8(5)a^6a} - 5\sqrt{5} + a^3\sqrt[3]{64(5)a} \\ &= 6\sqrt{5} - \underbrace{10a^3\sqrt[3]{5a}} - 5\sqrt{5} + \underbrace{4a^3\sqrt[3]{5a}} \\ &= \underline{\underline{\sqrt{5} - 6a^3\sqrt[3]{5a}}} \end{aligned}$$

• Multiplying Radicals

When multiplying radicals, multiply the coefficients and multiply the radicands. You can only multiply radicals if they have the same index.

In general, $(m\sqrt[k]{a})(n\sqrt[k]{b}) = mn\sqrt[k]{ab}$, where k is a natural number, and $m, n, a,$ and b are real numbers. If k is even, then $a \geq 0$ and $b \geq 0$.

Let's look at some examples...

$$\begin{array}{l}
 2\sqrt{14}(-3\sqrt{2}) \\
 = -6\sqrt{28} \\
 = -12\sqrt{7} \quad \leftarrow \text{Simplify!!}
 \end{array}
 \qquad
 \begin{array}{l}
 \text{Student A} \quad 3\sqrt{8}(5\sqrt{48}) \quad [3] \\
 = 15\sqrt{384} \\
 = 15(8\sqrt{6}) \\
 = \underline{120\sqrt{6}} \quad \checkmark
 \end{array}$$

$$\begin{array}{l}
 \text{Simplified first} \rightarrow \text{Student} \\
 = 3(2\sqrt{2})5(4\sqrt{3}) \\
 = (6\sqrt{2})(20\sqrt{3}) \\
 = \underline{120\sqrt{6}} \quad \checkmark
 \end{array}$$

$$\begin{aligned} & \underline{3}w^3\sqrt{2w^7} \bullet \underline{5}\sqrt[3]{12w^5} \\ & = 15w \sqrt[3]{2+4w^2} \\ & = 15w \sqrt[3]{8 \cdot 3w^2} \\ & = 30w^2 \sqrt[3]{3} \end{aligned}$$

$$5\sqrt{2}(5 - 2\sqrt{18})$$

$$(3\sqrt{5} + 2\sqrt{12})(\sqrt{15} - 4\sqrt{2})$$

Homework: Complete these 5 questions Am I Ready for Multiplication of Radicals??

Section 5.2 Warm-Up

1. Multiply.

- a) $(2s^2t)(3s^2t)$ b) $(-3x)(2xp)$
 c) $2b(3b - 1)$ d) $-(4x^2 - 3y^2)$
 e) $(2n - 3)(n + 1)$ f) $(3x - 4y)(x - 2y)$

2. Divide.

- a) $\frac{-6x^2y}{3x}$ b) $\frac{(11a^3 - 22a^2 - 44a^2b)}{(11a^2)}$
 c) $\frac{4t^2 - 12t}{-2t}$ d) $\frac{(3x - 5)(3x + 5)}{3x + 5}$

3. Express each entire radical as an equivalent mixed radical in simplest form.

- a) $\sqrt{20x^4y^8}$ b) $\sqrt{9xy^4}$
 c) $\sqrt{6m^5n}$ d) $\sqrt[3]{16t^4}$

4. Express each mixed radical as an equivalent entire radical.

- a) $3p\sqrt{2p}$ b) $4x^2\sqrt{3x}$
 c) $x\sqrt[3]{x}$ d) $-2y\sqrt[3]{5}$

5. Simplify. Assume that all variables represent positive values.

- a) $4\sqrt{p} - 3\sqrt{p} + \sqrt{p}$
 b) $x\sqrt{4} - x\sqrt{3} + x$
 c) $9\sqrt{ab} + 3\sqrt{ab} - \sqrt{49ab}$
 d) $\sqrt{11y} - \sqrt{44y}$
 e) $(30x + \sqrt{80}) - (20x - \sqrt{20})$
 f) $(8 + \sqrt{18x^2}) + (2 - \sqrt{8x^2}) - (5 - \sqrt{50x^2})$

Solutions...

Section 5.2

1. a) $6s^4t^2$ b) $-6x^2p$ c) $6b^2 - 2b$
 d) $-4x^2 + 3y^2$ e) $2n^2 - n - 3$ f) $3x^2 - 10xy + 8y^2$
 2. a) $-2xy$ b) $a - 2 - 4b$ c) $-2t + 6$ d) $3x - 5$
 3. a) $2x^2y^4\sqrt{5}$ b) $3y^2\sqrt{x}$ c) $m^2\sqrt{6mm}$ d) $2t\sqrt[3]{2t}$
 4. a) $\sqrt{18p^3}$ b) $\sqrt{48x^5}$ c) $\sqrt[3]{x^4}$ d) $-\sqrt[3]{40y^3}$
 5. a) $2\sqrt{p}$ b) $3x - x\sqrt{3}$ c) $5\sqrt{ab}$ d) $-\sqrt{11y}$
 e) $10x + 6\sqrt{5}$ f) $6\sqrt{2x} + 5$

Attachments

Mathematical Pathways Description.docx

Pre-Calculus 110 - Fall 2012.doc