Mat 1275 HW8

Exercises 8.4

1. Evaluate exactly and estimate without a calculator at 4: $\sqrt[3]{10x^2}$.

Sol: Key words: Evaluate, estimate,
$$x = 4$$
, $\sqrt[3]{10}$ cubic root of $10x^2$.
 $\Rightarrow \sqrt[3]{10(4)^2} = \sqrt[3]{5 \cdot 2 \cdot 4^2} = \sqrt[3]{5 \cdot 2 \cdot 2 \cdot 2 \cdot 2} = \sqrt[3]{5 \cdot 2 \cdot 2 \cdot 2} = \sqrt[3]{20}$

$$10 = 5 \cdot 2$$

$$4^2 = 2 \cdot 2 \cdot 2 \cdot 2$$

$$= \sqrt[3]{20}$$

2. Simplify
$$3\sqrt[4]{48x^9y^{18}z^6}$$
.

2. Simplify $3\sqrt[4]{48x^9y^{18}z^6}$.

Sol: Koyword: Simplify, $3\sqrt[4]{48x^9y^{18}z^6}$.

3. Evaluate
$$8^{2/3}$$
.

50l Koyword: Evaluate, fraction exponent 3

$$8^{\frac{2}{3}} = (8^{2})^{\frac{1}{3}} = 3 \cdot 8^{2} = 3 \cdot 2^{3} \cdot 2^{3}$$

$$8^{\frac{2}{3}} = (2^{3})^{\frac{2}{3}} = 2 \cdot 2 = 4$$

$$= 2 \cdot 2 \cdot 2 = 4$$

4. Simplify
$$\left(2\sqrt{\frac{2x^4y^3}{45z^7}}\right)^3$$
.

$$(a \cdot b)^{3} = a^{3}b^{3}$$

$$3(\alpha^{4})^{3} = \alpha^{4\cdot3} = \alpha^{12}$$

$$(\beta^{3})^{3} = \beta^{3\cdot3} = \beta^{9}$$

$$(\beta^{7})^{3} = \beta^{7\cdot3} = \beta^{21}$$

$$\left(2\sqrt{\frac{2\chi^4 y^3}{45z^7}}\right)^3$$

$$\stackrel{\square}{=} 2^3 \left(\sqrt{\frac{2X^4y^3}{45z^2}} \right)^3 \stackrel{\textcircled{=}}{=} 8 \sqrt{\left(\frac{2X^4y^3}{45z^2} \right)^3}$$

$$\frac{3}{2} 8 \sqrt{\frac{2^3 \chi^{12} y^9}{45^3 z^{21}}} = 8 \sqrt{\frac{2^2 \cdot 2 \cdot \chi^{12} \cdot y^8 y}{45^2 \cdot 45 \cdot z^2}}$$

$$= 8\sqrt{\frac{2^2 \chi^{12} y^8}{45^2 \cdot 2^{20}}} \cdot \sqrt{\frac{2 \cdot y}{45 \cdot 2}}$$

$$= 8. \frac{2. \chi^{6} y^{4}}{45. 2^{10}} \cdot \sqrt{\frac{2y}{452}} = \underbrace{\frac{16 \chi^{6} y^{4}}{452} \sqrt{\frac{2y}{452}}}_{452}$$

5. Simplify
$$5\sqrt{20} - 3\sqrt{45}$$
.

<u>501</u> Keyword: Simplify

$$0.20 = 4 \times 5 = 2^{2}.5$$

$$=5.2.\sqrt{5}-3.3.\sqrt{5}=10\sqrt{5}-9\sqrt{5}=\sqrt{5}$$

6. Multiply and simplify
$$(7\sqrt{3} + 2\sqrt{5})(2\sqrt{3} - 3\sqrt{5})$$
.

501. Keyword: Multiply, simplify
$$\frac{\text{Sol. keyword: Multiply, simplify}}{2.7.3}$$

$$=42$$

$$7\sqrt{3}$$

$$+2\sqrt{5}$$

$$(7\sqrt{3}+2\sqrt{5})$$

$$7\sqrt{3} + 2\sqrt{5}$$

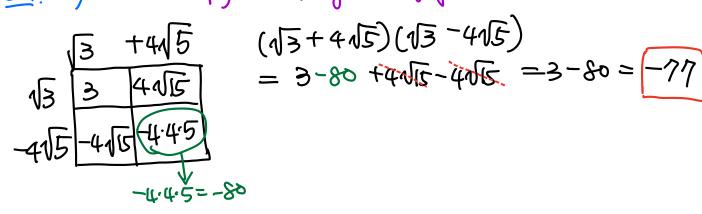
$$7\sqrt{3} + 2\sqrt{5}$$

$$2\sqrt{3} + 2\sqrt{5}$$

$$2\sqrt{5} + 2\sqrt{5$$

7. Multiply and simplify $(\sqrt{3} + 4\sqrt{5})(\sqrt{3} - 4\sqrt{5})$.

Sol keyword: Multiply, simplify. conjugate



8. Divide and simplify $\frac{7\sqrt{3} + 2\sqrt{5}}{2\sqrt{3} - 3\sqrt{5}}$.

Sol. Keyword: Divide, simplify, Rationalize, conjugate.

() Rationalize with conjugate
$$\frac{7\sqrt{3} + 2\sqrt{5}}{2\sqrt{3} - 3\sqrt{5}}$$
 (2 $\sqrt{3} + 3\sqrt{5}$)

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

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9. Simplify and write your answer using radical notation (assume x and y are positive):

Sol key word: Simplify.

Padical notation
$$\left(\frac{3\sqrt{xy^3}}{4\sqrt[3]{(9x)^2\sqrt{3y}}}\right)^2 = \left(\frac{3y\sqrt{xy}}{4\sqrt[3]{(9x)^2}\cdot\sqrt[3]{3y}}\right)^2 = \left(\frac{3y\sqrt{xy}}{4\sqrt[3]{(9x)^2}$$