

Unit 6 Review

★
★ Extra Practice ★
★ Questions ★

ex: Perform the indicated operation. Give your answer in simplest form.

$$a) \underline{6} \sqrt[3]{-8} \cdot \underline{7} \sqrt[3]{20}$$

1

32

~~243~~

$$42 \sqrt[3]{-160}$$

$$42 \sqrt[3]{-1 \cdot 32 \cdot 5}$$

$$-42 \cdot 2 \sqrt[3]{5}$$

$$\underline{-84 \sqrt[3]{5}}$$

ex: Perform the indicated operation. Give your answer in simplest form.

$$b) \frac{\sqrt[4]{2}}{\sqrt[4]{54}} = \sqrt[4]{\frac{2}{54}} = \sqrt[4]{\frac{1}{27}}$$

$$\frac{1}{\sqrt[4]{3^3}} \cdot \frac{\sqrt[4]{3}}{\sqrt[4]{3}}$$

$$\frac{\sqrt[4]{3}}{3}$$

$$\frac{5\sqrt{2}}{15} = \frac{\sqrt{2}}{3}$$

ex: Perform the indicated operation. Give your answer in simplest form.

$$c) (7 + \sqrt[3]{2})(5 + \sqrt[3]{16})$$

$$35 + 7\sqrt[3]{16} + 5\sqrt[3]{2} + \sqrt[3]{32}$$

$$35 + 7\sqrt[3]{16} + 5\sqrt[3]{2} + 2$$

$$37 + 7\sqrt[3]{16} + 5\sqrt[3]{2}$$

ex: Simplify. Assume all variables are positive.

$$\sqrt[4]{162x^2y^{12}z^9}$$

$$\boxed{3y^3z^2\sqrt[4]{2x^2z}}$$

$$\left\{ \begin{array}{l} 1 \\ 16 \\ 81 \end{array} \right.$$

$$\sqrt[4]{162x^2y^{12}z^9}$$

if negative

Non real

ex: Simplify.

$$\frac{12}{\sqrt[3]{27}}$$

$$\frac{12}{\sqrt[3]{3^3}} \cdot \frac{\sqrt[3]{3^2}}{\sqrt[3]{3^2}}$$

$$\frac{12 \sqrt[3]{9}}{3}$$

$$\boxed{4 \sqrt[3]{9}}$$

ex: Simplify.

$$-9^{-3/2}$$



$$-1 \cdot 9^{-3/2}$$

$$-1 \cdot \frac{1}{9^{3/2}}$$

$$-1 \cdot \frac{1}{27}$$

$$\boxed{-\frac{1}{27}}$$

$$(-9)^{-3/2}$$

→

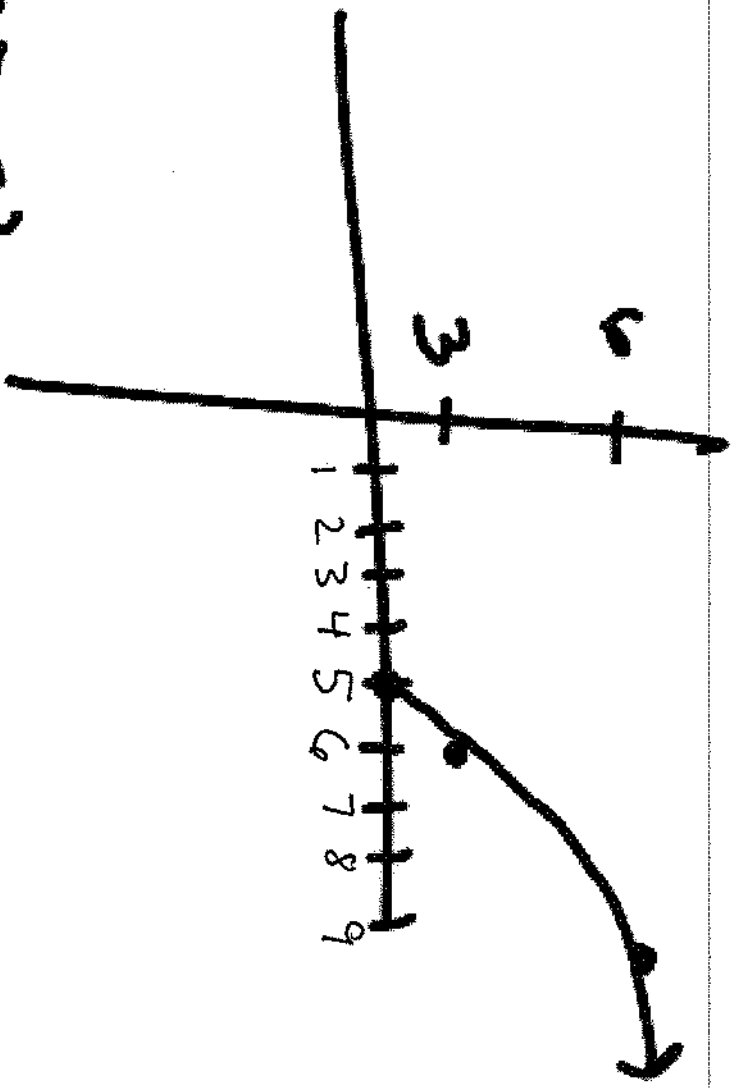
$$\frac{1}{(\sqrt{-9})^3}$$

Normal

ex: Sketch and state the domain and range in set notation.

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

x	y
5	0
6	3
9	6



$$\{x \mid x \geq 5\}$$

$$\{y \mid y \geq 0\}$$

ex: Write in radical form.

$$10^{7/6}$$

$$\sqrt[6]{10^7}$$

or $\left[(\sqrt[6]{10})^7 \right]$

Know both!

ex: Write in exponential form.

$$\sqrt[6]{x}$$

$$x^{1/6}$$

ex: Simplify.

$$4\sqrt[6]{3} + 2\sqrt[4]{32} - 3\sqrt[6]{192} - 2\sqrt[6]{192}$$

$$4\sqrt[6]{3} + 2\sqrt[4]{32} - 5\sqrt[6]{192}$$

$$4\sqrt[6]{3} + 4\sqrt[4]{2} - 10\sqrt[6]{3}$$

$$4\sqrt[4]{2} - 6\sqrt[6]{3}$$

ex: Solve.

$$5\sqrt{x-4} + 1 = 46$$

$$5\sqrt{x-4} = 45$$

$$(\sqrt{x-4})^2 \stackrel{?}{=} (9)^2$$

$$x-4 = 81$$

$$\boxed{x = 85} \checkmark$$

ex: Simplify. Assume all variables are positive.

$$\left(\sqrt[3]{8x^4y^3}\right)\left(\sqrt[3]{2x^2y}\right)$$

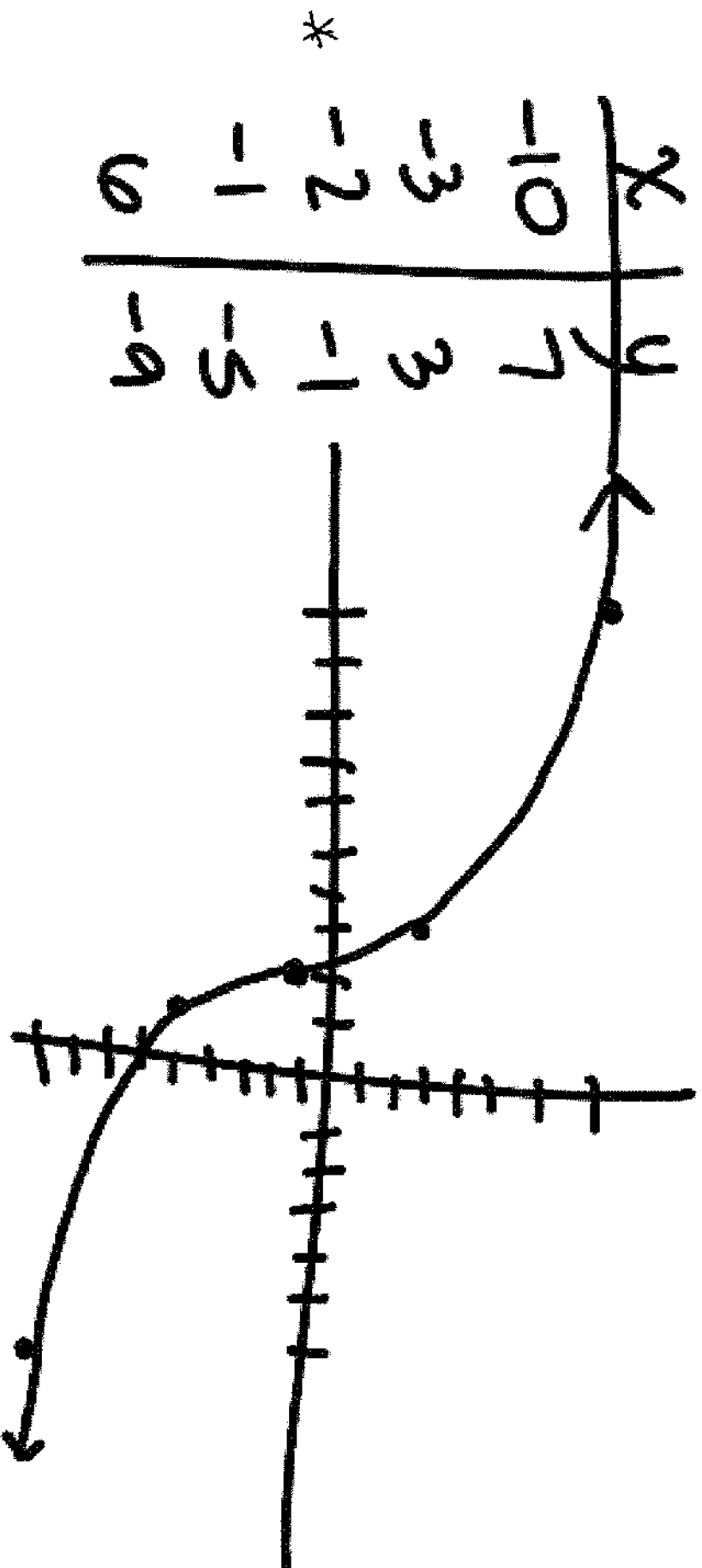
$$\sqrt[3]{16x^6y^4}$$

$$2x^2y\sqrt[3]{2y}$$

ex: Sketch and state the domain and range in interval notation.

$$(-\infty, \infty)$$

$$y = -4\sqrt[3]{x+2} - 1 \quad (-\infty, \infty)$$



ex: Solve.

$$\sqrt[4]{3x+4} - \sqrt[4]{7x} = 0$$

$$\left(\sqrt[4]{3x+4}\right)^4 = \left(\sqrt[4]{7x}\right)^4$$

$$3x+4 = 7x$$

$$4 = 4x$$

$$x = 1 \quad \checkmark$$

ex:

Simplify: $3\sqrt[4]{32} + \frac{5}{(162)^{-1/4}}$

$$6\sqrt{2} + 5\sqrt{162}$$

$$6\sqrt{2} + 15\sqrt{2}$$

$$\boxed{21\sqrt{2}}$$

ex:

Solve for x:

$$3x^{\frac{2}{3}} + 5 = 32$$

$$3x^{-2/3} = 27$$

$$(x^{-2/3})^{\pm 3/2} = (\pm 9)^{-3/2}$$

$$x = \pm \frac{1}{27}$$

$$x = \pm \frac{1}{27}$$