

Chapter 6 Review (6.1, 6.2, 6.5, 6.6)

Rewrite the expression using rational exponents.

$$\sqrt[5]{7^3} = 7^{\frac{3}{5}}$$

$$\sqrt[9]{-2^8} = (-2)^{\frac{8}{9}}$$

$$\sqrt{3^{11}} = 3^{\frac{11}{2}}$$

$$(\sqrt[3]{10})^2 = 10^{\frac{2}{3}}$$

Rewrite the expression using radical notation.

$$5^{1/7} = \sqrt[7]{5}$$

$$-6^{4/5} = -\sqrt[5]{6^4}$$

$$(-6)^{4/5} = (\sqrt[5]{-6})^4$$

$$8^{3/7} = (\sqrt[7]{8})^3$$

Evaluate each expression. Try without a calculator at first.

$$32^{3/5} = (\sqrt[5]{32})^3 = 2^3 = 8$$

$$-125^{4/3} = -(\sqrt[3]{125})^4 = -5^4 = -625$$

$$(-64)^{2/3} = (\sqrt[3]{-64})^2 = (-4)^2 = 16$$

$$81^{5/4} = (\sqrt[4]{81})^5 = 3^5 = 243$$

Evaluate the following with a calculator. Round your answer to three decimal places.

$$\sqrt[5]{-53} \approx -2.212$$

$$36^{4/7} \approx 7.750$$

$$\sqrt[5]{247} \approx 85.565$$

$$72^{2/5} \approx 5.533$$

Simplify the following expressions.

$$\sqrt[3]{108x^4y^6} = \sqrt[3]{4 \cdot 27x^3x y^3y^3} = 3xy^2\sqrt[3]{4x}$$

$$\sqrt[5]{64x^3y^{12}z^{15}} = \sqrt[5]{2 \cdot 32x^3y^9y^3z^9z^6} = 2y^2z^3\sqrt[5]{2x^3y^3z^2}$$

$$4\sqrt[3]{c^4d} + c\sqrt[3]{125cd} = 4c\sqrt[3]{cd} + 5c\sqrt[3]{cd} = 9c\sqrt[3]{cd}$$

$$3\sqrt[4]{32} - \sqrt[4]{2} = 3 \cdot 2\sqrt[4]{2} - \sqrt[4]{2} = 6\sqrt[4]{2} - \sqrt[4]{2} = 5\sqrt[4]{2}$$

Solve the following equations for x. Check for extraneous solutions.

$$x^6 - 321 = 408$$

$$x^6 = 729$$

$$\sqrt[6]{x^6} = \sqrt[6]{729}$$

$$x = 3$$

$$\frac{3x^{3/4}}{3} = \frac{24}{3}$$

$$x^{3/4} = 8$$

$$(x^{3/4})^{4/3} = 8^{4/3}$$

$$x = 16$$

* Change to 10

$$\frac{\sqrt{x^2-1} - \sqrt{3x}}{(\sqrt{x^2-10})^2 - (\sqrt{3x})^2}$$

$$x^2 - 10 = 3x$$

$$x^2 - 3x - 10 = 0$$

$$(x-5)(x+2) = 0$$

$$x=5 \quad x=-2$$

$$\sqrt{5^2-10} = \sqrt{3(5)} \quad \sqrt{(-2)^2-10} = \sqrt{3(-2)}$$

$$\sqrt{25-10} = \sqrt{15} \quad \sqrt{4-10} = \sqrt{-6}$$

$$\sqrt{15} = \sqrt{15} \quad \sqrt{-6} = \sqrt{-6} \checkmark$$

Solve the following equations for x. Check for extraneous solutions.

$$(x-3)^2 = (\sqrt{x-1})^2$$

$$x^2 - 6x + 9 = x - 1$$

$$x^2 - 7x + 10 = 0$$

$$(x-5)(x-2) = 0$$

$x=5$ ~~$x=2$~~

$$5-3 = \sqrt{5-1} \quad 2-3 = \sqrt{2-1}$$

$$2 = \sqrt{4} \quad -1 = \sqrt{1}$$

$$2 = 2 \checkmark \quad -1 = 1 \text{ X}$$

$$(\sqrt{2x+3} + 2)^2 = (\sqrt{6x+7})^2$$

$$(\sqrt{2x+3})^2 + 2\sqrt{2x+3} + 2\sqrt{2x+3} + 4 = 6x + 7$$

$$2x+3 + 4\sqrt{2x+3} + 4 = 6x + 7$$

$$-2x \quad -7 \quad -2x \quad -7$$

$$\frac{4\sqrt{2x+3}}{4} = \frac{4x}{4}$$

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

$$2x+3 = x^2$$

$$0 = x^2 - 2x - 3$$

$$0 = (x-3)(x+1)$$

$x=3$ ~~$x=-1$~~

$$\sqrt{2(3)+3} + 2 = \sqrt{6(3)+7}$$

$$\sqrt{9} + 2 = \sqrt{25}$$

$$3 + 2 = 5 \checkmark$$

$$\sqrt{2(-1)+3} + 2 = \sqrt{6(-1)+7}$$

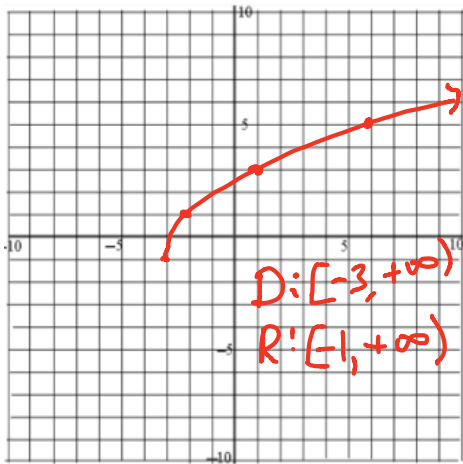
$$\sqrt{1} + 2 = \sqrt{1}$$

$$1 + 2 = 1$$

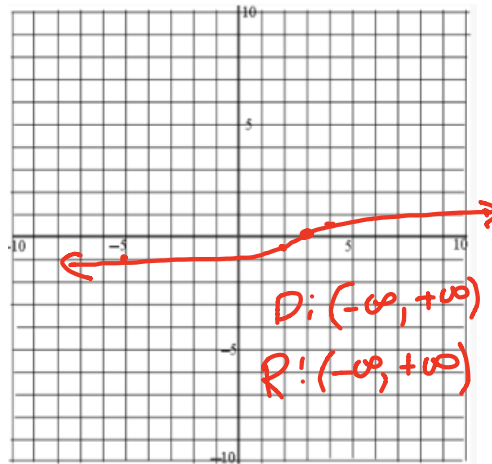
$$3 = 1 \text{ X}$$

Graph the following functions. Identify the domain and range.

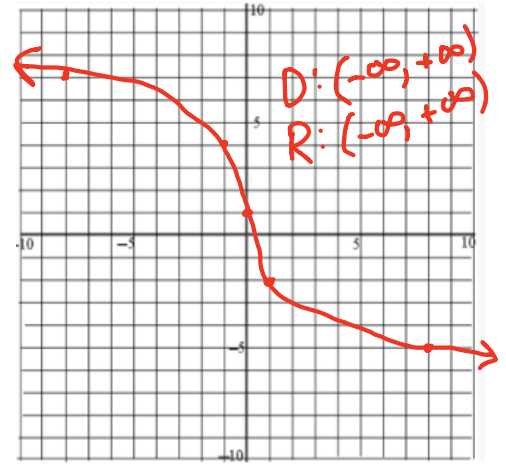
$$y = 2\sqrt{x+3} - 1$$



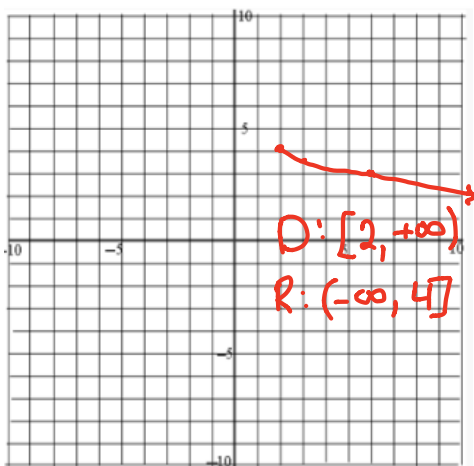
$$y = \frac{1}{2}\sqrt[3]{x-3}$$



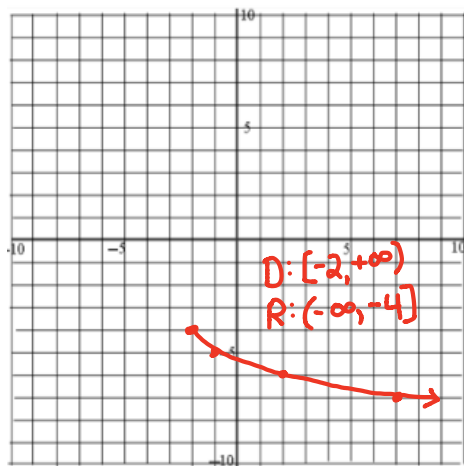
$$y = -3\sqrt[3]{x} + 1$$



$$y = -\frac{1}{2}\sqrt{x-2} + 4$$



$$y = -\sqrt{x+2} - 4$$



$$y = -\sqrt[3]{x+1} - 4$$

