Q's on 7.3

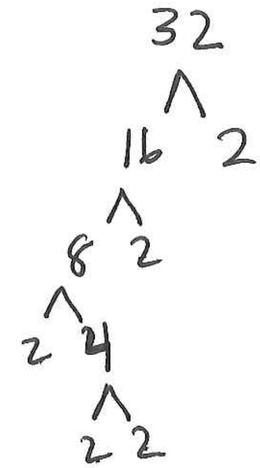
39
61
59
47

95/97
81

39. $\dfrac{\sqrt[5]{64}}{\sqrt[5]{-2}} = \sqrt[5]{-32}$

$= \sqrt[5]{(-2)^5}$

$= -2$




~~59.~~
47. $\sqrt[3]{-5a^6}$

$= \sqrt[3]{a^6} \cdot \sqrt[3]{-1} \cdot \sqrt[3]{5}$

$= a^2 \cdot -1 \cdot \sqrt[3]{5}$

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

$(-1)(-1)(-1)$

$(-1)^3 = -1$

$(-1)^3 = -1^3$

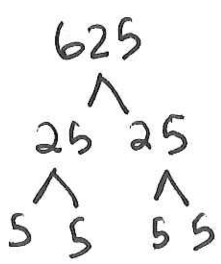
$(-2)^3 = -2^3$

$\sqrt[5]{-1} = -\sqrt[5]{1}$

$\sqrt[5]{-32} = -2$

$\sqrt[5]{-7} = -\sqrt[5]{7}$

59. $\sqrt[4]{25z} \cdot \sqrt[4]{25z}$




$= \sqrt[4]{25^2 z^2}$

$= \sqrt[4]{5^4 \cdot z^2}$

$= 25^{2/4} \cdot z^{2/4} = 25^{1/2} \cdot z^{1/2}$

$= \sqrt{25}\sqrt{z}$

$= 5\sqrt{z}$

$= \sqrt[4]{5^4} \cdot \sqrt[4]{z^2}$

$= 5 \cdot \sqrt[4]{z^2}$

$= 5 \cdot z^{2/4}$

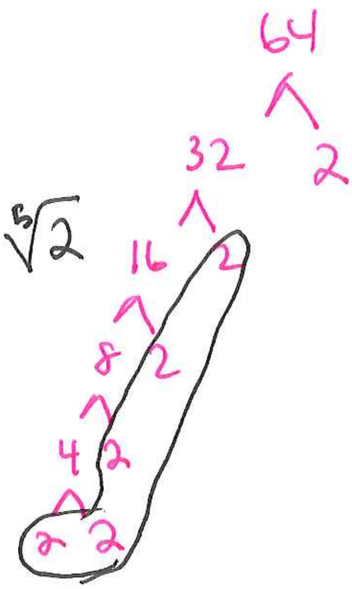
$= 5 \cdot z^{1/2}$

$= 5\sqrt{z}$

81. $\sqrt[5]{-64}$

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

$= -2\sqrt[5]{2}$




95. $\sqrt[3]{\dfrac{27x^2}{y^3}}$

$= \sqrt[3]{\dfrac{3^3}{y^3}} \cdot \sqrt[3]{\dfrac{x^2}{1}}$

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

Q's 7.4

$\sqrt{4} \cdot \sqrt{3}$

$2\sqrt{3}$

103. $\sqrt{\dfrac{b}{12}} = \dfrac{\sqrt{b}}{\sqrt{12}} = \dfrac{\sqrt{b} \cdot \sqrt{3}}{2\sqrt{3} \cdot \sqrt{3}}$

$= \dfrac{\sqrt{3b}}{2\sqrt{9}}$

$= \dfrac{\sqrt{3b}}{2 \cdot 3}$

$$= \frac{\sqrt{3b}}{6}$$

57. $\sqrt{4x+8} + \sqrt{x+2}$

$= \sqrt{4(x+2)} + \sqrt{x+2}$

$\sqrt{4}\,\sqrt{x+2}$

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

$= 3\sqrt{x+2}$

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

$2x + 1x = 3x$

# Section 7.5 - More Radical Functions

## Root Functions

$$f(x) = \sqrt[n]{x}$$

## Power Functions

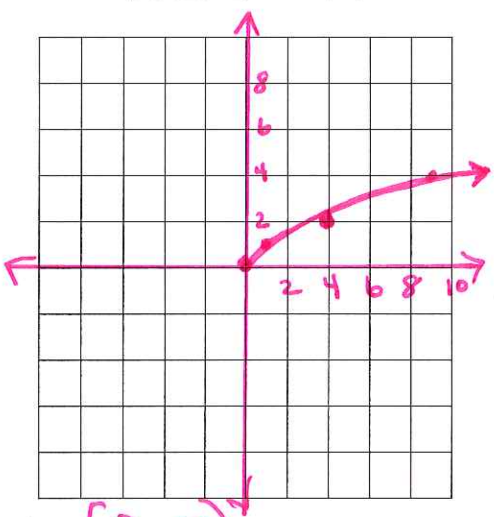
$f(x) = x^p$, where $p$ is a rational number

## Comparing Even and Odd Root Functions

1. Graph the two functions below on your graphing calculator. Use the same window to draw both of your graphs and transfer them onto the paper.

$f(x) = \sqrt{x}$

| $x$ | $f(x)$ |
|---|---|
| -1 | undefined |
| 0 | 0 |
| 1 | 1 |
| 4 | 2 |
| 9 | 3 |

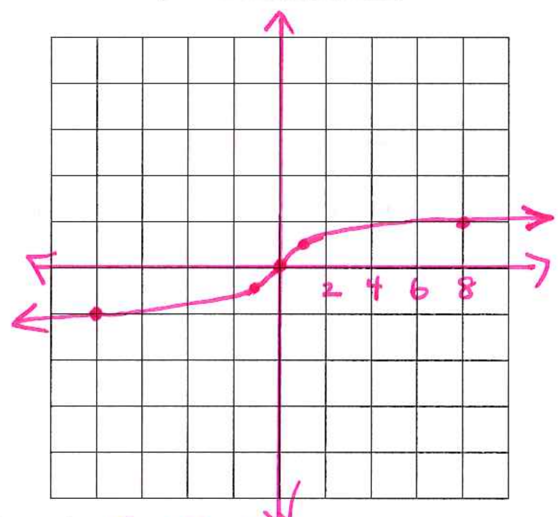



Domain: $[0,\infty)$

Range: $[0,\infty)$

$f(x) = \sqrt[3]{x}$ x^(1/3)

| $x$ | $f(x)$ |
|---|---|
| -8 | -2 |
| -1 | -1 |
| 0 | 0 |
| 1 | 1 |
| 8 | 2 |




Domain: $(-\infty,\infty)$

Range: $(-\infty,\infty)$

## The Domain and Range of Root Functions

The domain and range for any even root function is $[0,\infty)$ ✓ The number could change based on the input $\sqrt{x}$ $\sqrt{x-2}$

The domain and range for any odd root function is $\mathbb{R}$.

Why? Because you can't have a negative in an even root function, but you can in an odd root function.

**Evaluating Root and Power Functions**

2. Evaluate each root or power function at the given x-values. Simplify by hand first. When the result is not an integer, approximate it to the nearest hundredth. If the result is not a real number, so state.

**Root Functions**

a. $f(x) = \sqrt[4]{x+1}$  $x = 15$ and $-15$

$f(15) = \sqrt[4]{15+1} = \sqrt[4]{16} = \sqrt[4]{2^4} = 2$

$f(-15) = \sqrt[4]{-15+1} = \sqrt[4]{-14}$ not a real number

b. $f(x) = \sqrt[3]{(x+1)^2}$  $x = -2$ and $7$

$f(-2) = \sqrt[3]{(-2+1)^2} = \sqrt[3]{(-1)^2} = \sqrt[3]{1} = 1$

$f(7) = \sqrt[3]{(7+1)^2} = \sqrt[3]{8^2} = \sqrt[3]{64}$

$= \sqrt[3]{4^3}$

$= 4$

64
16 4
4 4

**Power Functions**

c. $f(x) = x^{3/4}$  $x = 16$ and $-1$

$f(16) = 16^{3/4} = \sqrt[4]{16^3} = \sqrt[4]{(2^4)^3} = \cancel{\sqrt[4]{(2^3)^4}} = 8$

$= 2^3 = 8$

$f(-1) = (-1)^{3/4} = \sqrt[4]{(-1)^3} = \sqrt[4]{-1}$ not a real number

need ( )

d. $f(x) = x^{-3/4}$  $x = 16$ and $-1$

$f(16) = 16^{-3/4} = \frac{1}{16^{3/4}} = \frac{1}{\sqrt[4]{16^3}} = \frac{1}{\sqrt[4]{(2^4)^3}} = \frac{1}{2^3} = \frac{1}{8}$

$f(-1) = (-1)^{-3/4} = \frac{1}{(-1)^{3/4}} = \frac{1}{\sqrt[4]{(-1)^3}} = \frac{1}{\sqrt[4]{-1}} =$ not a real number

e. $f(x) = x^{4/3}$  $x = 16$ and $-1$

$f(16) = 16^{4/3} = \sqrt[3]{16^4} = \sqrt[3]{16^3} \cdot \sqrt[3]{16}$

$= 16 \cdot \sqrt[3]{2^4}$

$= 16 \cdot \sqrt[3]{2^3} \cdot \sqrt[3]{2}$

$= 16 \cdot 2 \cdot \sqrt[3]{2}$

$= 32\sqrt[3]{2}$

$f(-1) = (-1)^{4/3} = \sqrt[3]{(-1)^4}$

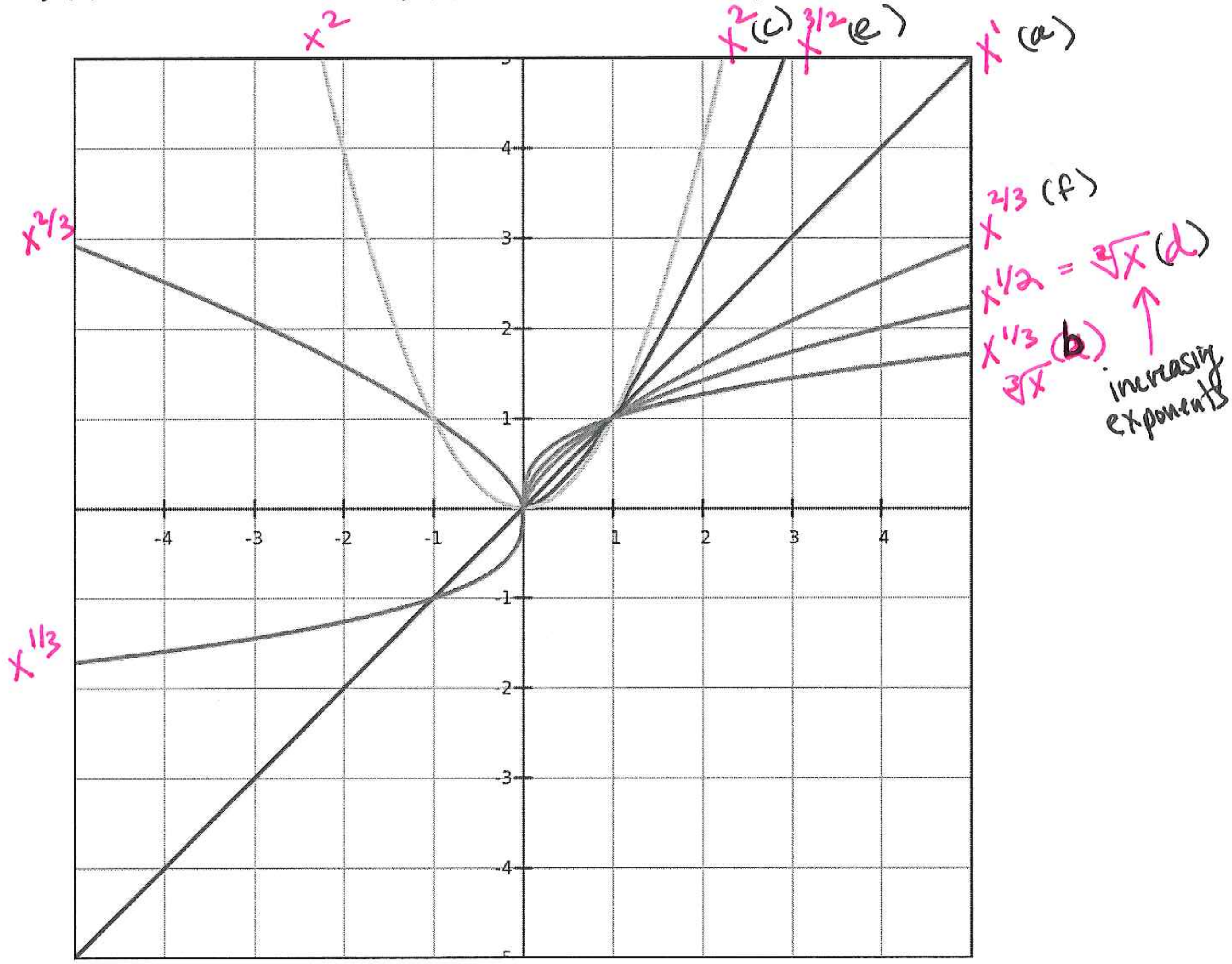
$= \sqrt[3]{1}$

$= 1$

**Power Function Matching**

3. Use your problem solving and critical thinking skills to match the functions with the graphs. Write $x$ with the proper exponent next to its graph (example: $x^2$). Match them without using your calculator and then use your calculator to check.

a. $f(x) = x$
b. $f(x) = x^{1/3}$
c. $f(x) = x^2$
d. $f(x) = x^{1/2}$
e. $f(x) = x^{3/2}$
f. $f(x) = x^{2/3}$




What pattern(s) do you notice with the graphs and exponents? Explain.

The graphs go up as the exponents increase.