Intermediate Algebra Name: Key

Chapter 7 Test Review

Use all *resources* (notes, book, etc) while working on the review!!

Evaluate completely.

1.) $\sqrt[3]{-125}$

$\boxed{-5}$

2.) $\sqrt[5]{32}$

$\boxed{2}$

3.) $8^{\frac{2}{3}} = \left(\sqrt[3]{8}\right)^2$

$\boxed{4}$

4.) $9^{\frac{3}{2}} = \left(\sqrt{9}\right)^3$

$\boxed{27}$

5.) $2\sqrt[4]{81}$

$2 \cdot 3$

$\boxed{6}$

6.) $\sqrt[3]{27} \cdot \sqrt[3]{64}$

$3 \cdot 4$

$\boxed{12}$

Simplify the radical expression completely. Answers should NOT be written as decimals.

7.) $\sqrt{48}$

16 3

$\boxed{4\sqrt{3}}$

8.) $3\sqrt{12} \cdot 4\sqrt{2}$

$12\sqrt{24}$

4 6

$\boxed{24\sqrt{6}}$

9.) $8\sqrt{5} - 3\sqrt{5}$

$\boxed{5\sqrt{5}}$

10.) $3\sqrt{50} + 2\sqrt{32}$

25 2 16 2

$3 \cdot 5\sqrt{2} + 2 \cdot 4\sqrt{2}$

$15\sqrt{2} + 8\sqrt{2}$

$\boxed{23\sqrt{2}}$

11.) $\frac{\sqrt[4]{48}}{\sqrt[4]{3}}$

$\sqrt[4]{16}$

$\boxed{2}$

12.) $\frac{6\sqrt[3]{40}}{2\sqrt[3]{5}}$

$3\sqrt[3]{8}$

$3 \cdot 2$

$\boxed{6}$

13.) $\sqrt[3]{16x^3y^4}$

8 2

$\boxed{2xy\sqrt[3]{2y}}$

14.) $\sqrt{9x^3z^4}$

$\boxed{3xz^2\sqrt{x}}$

Objective: To be able to rewrite the expression using either rational exponents or radicals.

15.) $x^{\frac{3}{4}}$ $\quad (\sqrt[4]{x})^3$

16.) $(\sqrt[3]{z})^5$ $\quad z^{5/3}$

Objective: To be able to simplify expression containing rational exponents. Simplify COMPLETELY.

need common denominator

17.) $(4x^4)^{\frac{1}{2}}$

$\sqrt{4x^4}$

$\boxed{2x^2}$

18.) $3^{\frac{1}{2}} \cdot 3^{\frac{3}{2}}$

$3^{\frac{1}{2}+\frac{3}{2}} = 3^{4/2}$

$= 3^2 = \boxed{9}$

19.) $4^{\frac{1}{6}} \cdot 4^{\frac{1}{3} \cdot \frac{2}{2}}$

$4^{\frac{1}{6}+\frac{2}{6}}$

$4^{3/6} = 4^{1/2}$

$\sqrt{4} = \boxed{2}$

20.) $\dfrac{81^{\frac{5}{8}}}{81^{\frac{3}{8}}}$

$81^{5/8 - 3/8}$

$81^{2/8} = 81^{1/4}$

$\sqrt[4]{81} = \boxed{3}$

Objective: To be able to solve equations that contains radicals or rational exponents. Don't forget to check for extraneous solutions!!

21.) $\sqrt[3]{x} - 5 = 0$

$+5 \quad +5$

$(\sqrt[3]{x})^3 = (5)^3$

$\boxed{x = 125}$

22.) $3\sqrt{x+4} - 1 = 8$

$+1 \quad +1$

$\dfrac{3\sqrt{x+4}}{3} = \dfrac{9}{3}$

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

$x + 4 = 9$

$-4 \quad -4$

$\boxed{x = 5}$

23.) $\sqrt[3]{4x} - \sqrt[3]{x+6} = 0$

$+\sqrt[3]{x+6} \quad +\sqrt[3]{x+6}$

$(\sqrt[3]{4x})^3 = (\sqrt[3]{x+6})^3$

$4x = x + 6$

$-x \quad -x$

$\dfrac{3x}{3} = \dfrac{6}{3}$

$\boxed{x = 2}$

24.) $(x - 5)^2 = (\sqrt{x+1})^2$

$(x-5)^2 = x + 1$

$(x-5)(x-5) = x + 1$

$x^2 - 10x + 25 = x + 1$

$-x \quad -1 \quad -x \quad -1$

$x^2 - 11x + 24 = 0$

$(x-8)(x-3) = 0$

$\boxed{x = 8}$ $\quad \cancel{x = 3}$ ← extraneous solution

25.) $x^{\frac{3}{2}} + 10 = 18$

$-10 \quad -10$

$\left(x^{3/2}\right)^{2/3} = (8)^{2/3}$

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

$= (2)^2$

$\boxed{x = 4}$

26.) $(x+5)^{\frac{2}{3}} - 2 = 7$

$+2 \quad +2$

$\left[(x+5)^{2/3}\right]^{3/2} = (9)^{3/2}$

$x+5 = \left(\pm\sqrt{9}\right)^3$

$x+5 = \left(\sqrt{9}\right)^3 \qquad x+5 = \left(-\sqrt{9}\right)^3$

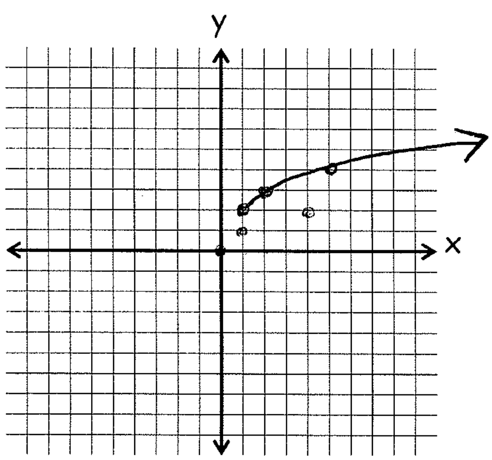
$x+5 = 27 \qquad x+5 = -27$

$-5 \quad -5 \qquad -5 \quad -5$

$\boxed{x = 22 \text{ and } x = -32}$

Objective: To be able to graph square root and cubic functions and then find the domain and range. You should be able to do this **without** using a calculator.

27.) $f(x) = \sqrt{x-1} + 2$



Transformations: right 1

up 2

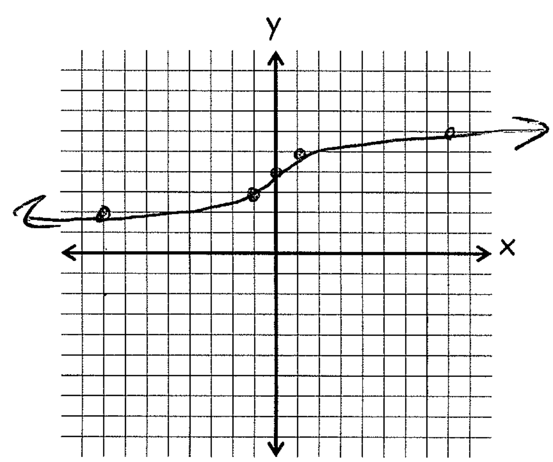
Domain: $[1, \infty)$

Range: $[2, \infty)$

x-intercept: none

y-intercept: none

28.) $f(x) = \sqrt[3]{x} + 4$



Transformations: up 4

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

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

x-intercept: $(-64, 0)$

y-intercept: $(0, 4)$

sub zero in for y

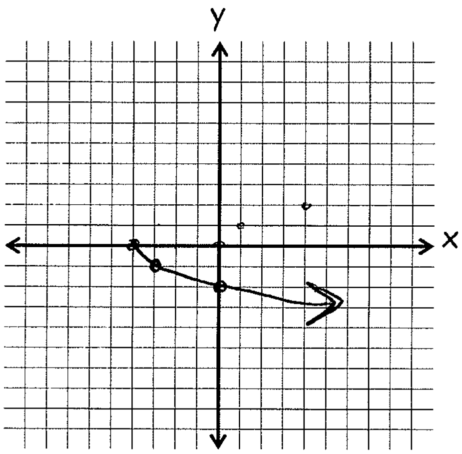
$0 = \sqrt[3]{x} + 4$

$-4 \qquad -4$

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

$-64 = x$

29). $f(x) = -\sqrt{x+4}$



Transformations: left 4, reflection over x-axis

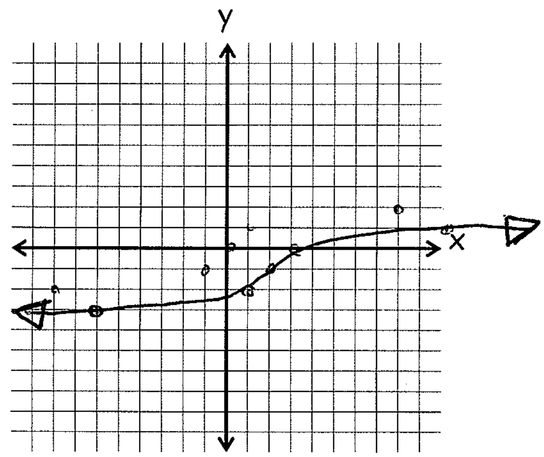
Domain: $[-4, \infty)$

Range: $(-\infty, 0]$

x-intercept: $(-4, 0)$

y-intercept: $(0, -2)$

30.) $f(x) = \sqrt[3]{x-2} - 1$



Transformations: right 2, down 1

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

Range: $(-\infty, \infty$

x-intercept: $(3, 0)$

y-intercept: $(0, -2.26)$

plug zero in for x

$y = \sqrt[3]{0-2} - 1$

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

$= -2.26$

Write an equation to fit the following graph.

31.) $f(x) = \sqrt{x-3} + 2$