Name __Key!__

Chapter 7 Test Review – Part II
Calculator Allowed

1) Evaluate 3^{-4}. Your answer should be a whole number or a simple fraction.

$$3^{-4} = \frac{1}{3^4} = \boxed{\frac{1}{81}}$$

2) Evaluate $(1000)^{\frac{1}{3}}$. Your answer should be a whole number or a simple fraction.

$100 \quad 10$

$10 \quad 10$

$\boxed{10}$

3) Evaluate $\left(\dfrac{125}{216}\right)^{-\frac{2}{3}}$. Your answer should be a whole number or a simple fraction.

$$\frac{125^{-2/3}}{216^{-2/3}} = \frac{216^{2/3}}{125^{2/3}} = \boxed{\frac{36}{25}}$$

4) Evaluate $\left(3^{-2}\right)$. Your answer should be a whole number or a simple fraction.
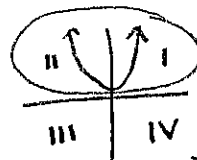
$\boxed{1}$

5) Consider the function $f(x) = x^n$, where n is an (even) positive integer and $x < 0$.

   a. State the (range) of this function.

   Positive real #'s

   b. In which quadrant(s) is the graph of f?

   1 & 2

6) Karla puts (750) in a savings account that pays (3.5%) compounded monthly. Assuming she makes no other deposits or withdrawals, how much money will she have in this account after (9 years)?

   $r = .035$ $n = 12$

$$A = 750\left(1 + \frac{.035}{12}\right)^{12 \cdot 9}$$

$$= \boxed{\$1027.22}$$

7) Simplify $(8a^7b)(5a^6b^8)$

$$\underline{8^2(a^{14})b^2} \cdot 5(a^6)b^8$$

$$= 64a^{20}b^{10} \cdot 5$$

$$\boxed{320a^{20}b^{10}}$$

8) Simplify $\dfrac{16a^{-4}b^3}{2a^{-6}b^{-2}}$ $= \boxed{8a^2b^5}$

9) In 1993, the total energy consumption of the people in the state of California was 6.99×10^{15} Btu. The population of the state in that year was approximately 3.04×10^7. Find the average energy consumption per person in California in 1993. (Leave your answer in scientific notation).

$$\frac{(6.99) \ 10^{15}}{(3.04) \ 10^7} = \boxed{2.30 \times 10^8}$$

10) Estimate $975^{2/3}$ to the nearest hundredth.

$\downarrow$ $\underline{2 \text{ decimals}}$

calculator!

$$\boxed{98.34}$$

11) The formula $d = 1.82r^{2/3}$ gives an excellent approximation of a planet's average distance (d) from the sun in millions of miles based on the number of Earth days (r) it takes the planet to make one revolution around the sun.

Venus revolves around the sun once every 225 days. What is the average distance from Venus to the sun?

$$d = 1.82r^{2/3}$$

$$d = \underline{1.82 \cdot 225^{2/3}}$$

calculator!

$$\boxed{d = 67.3 \text{ million miles from the sun}}$$

12) Solve $2x^3 - 50 = 200$. Your solution should be a whole number or simple fraction.

$$\frac{+50 \quad +50}{2x^3 = 250} \to x^3 = 125$$

$$\frac{2x^3}{2} = \frac{250}{2} \quad (x^3)^{1/3} = 125^{1/3} \quad \boxed{x = 5}$$

13) Solve $x^{-4/5} = 16$. Your solution should be a whole number or simple fraction.

$$\left(x^{-4/5}\right)^{-5/4} = 16^{-5/4}$$

$$\boxed{x = \frac{1}{32}}$$

14) Arrange the following in order from least to greatest when $x > 1$.

$$x^2, x^{1/2}, x^{-2}, x \qquad ex:$$

$$2^2, \quad 2^{1/2}, \quad 2^{-2}, \quad 2$$
$$\downarrow \qquad \downarrow \qquad \downarrow \qquad \downarrow$$
$$4 \quad 1.414 \quad .25 \quad 2$$
$$④ \qquad ② \qquad ① \qquad ③$$

$$\boxed{X^{-2}, \ X^{1/2}, \ X, \ X^2}$$

15) Solve $3^6 = (3p)^3$. Your solution should be a whole number or simple fraction.

$$\downarrow$$

$$729 = 3^3 p^3 \to 27 = p^3$$

$$\frac{729}{27} = \frac{27 p^3}{27} \quad 27^{1/3} = \left(p^{3}\right)^{1/3}$$

$$\boxed{3 = p}$$

16) Solve $4^8 \cdot 5^{-8} = z^8$. Your solution should be a whole number or simple fraction.

$$\frac{4^8}{5^8} = z^8 \to \boxed{\frac{4}{5} = z}$$

$$\left(\frac{4^8}{5^8}\right)^{1/8} = \left(z^8\right)^{1/8}$$

17) The point (-2, -32) lies on the graph of a power function.

$$\overset{x}{} \quad \overset{y}{\leftrightarrows} \ neg. \ range$$

a. Is this function even or odd?

$$odd$$

b. Write an equation for this power function.

$$y = x^n \to -32 = (-2)^{\textcircled{n} \to 5} \quad so, \quad \boxed{y = x^5}$$

c. Give the coordinates of four other points that lie on this line.

$$x = 1 \to y = 1^5, \ so \ y = 1 \to (1,1)$$
$$x = 2 \to y = 2^5, \ so \ y = 32 \to (2, 32)$$
$$x = 3 \to y = 3^5, \ so \ y = 243 \to (3, 243)$$
$$x = 4 \to y = 4^5, \ so \ y = 1024 \to (4, 1024)$$

A $r = .047$

18) Maggie now has $3000 in a savings account that has been earning interest at a rate of 4.7% compounded quarterly. How much was in the account four years ago, assuming she made no deposits or withdrawals?

$n = 4$ $t = 4$

$$3000 = P\left(1 + \frac{.047}{4}\right)^{4 \cdot 4}$$

$$\frac{3000}{1.206} = \frac{P \cdot 1.206}{1.206}$$

$\boxed{\$2487.56 = P}$
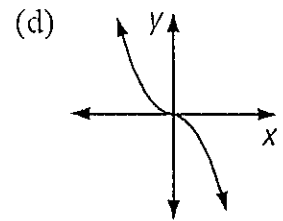
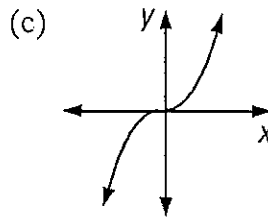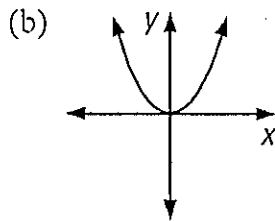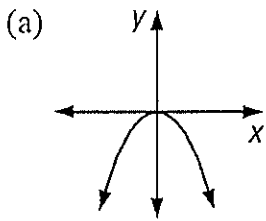19) Match each power function with its graph below.

I. $y = x^3 \rightarrow$ (c)

II. $y = -x^4 \rightarrow$ (a)

III. $y = -x^5 \rightarrow$ (d)

IV. $y = x^2 \rightarrow$ (b)

$\Big\}$ type in & graph on calculator!

(a)   (b)   (c)   (d)

20) Simplify $\left(\dfrac{12m^5 n^3}{-4m^9 n}\right)^{-1}$

$$\rightarrow \frac{12^{-1} m^{-5} n^{-3}}{(-4)^{-1} m^{-9} n^{-1}} = \frac{-4 m^9 n}{12 m^5 n^3} = -\frac{1}{3} m^4 (n)^{-2} \text{ move!}$$

$$= \boxed{-\frac{m^4}{3n^2}}$$

21) Mrs. Merritt decides to spring a pop quiz on you today! The quiz consists of five multiple choice questions with four options for each question. You're angry and annoyed that you have to take a pop quiz, and you're feeling totally unprepared, so you decide to randomly guess on each question and hope for the best. What's the probability that you score a 100% on this quiz (which, by the way, would totally brighten your day)?

Note: Your answer here could be written as a decimal or as a percent, but do not leave it in scientific notation!

$$\underbrace{\tfrac{1}{4}}_{\#1} \cdot \underbrace{\tfrac{1}{4}}_{\#2} \cdot \underbrace{\tfrac{1}{4}}_{\#3} \cdot \underbrace{\tfrac{1}{4}}_{\#4} \cdot \underbrace{\tfrac{1}{4}}_{\#5} = \left(\tfrac{1}{4}\right)^5 = \frac{1^5}{4^5} = \boxed{\frac{1}{1024}}$$

$\boxed{\text{or } .000977}$