Advanced Functions – 4.5 WS: Power Function/Equation Name: _____

I. Determine which are power functions, circle YES or NO. If YES, state value of k and p.

1.) $f(x) = 13\sqrt[3]{x}$ power function? Circle one: YES NO where k = _____ and p = _____

2.) $3y = 9x^2$ power function? Circle one: YES NO where k = _____ and p = ____

3.) $f(x) = 2(x + 5)^3$ power function? Circle one: YES NO where k = _____ and p = ____

4.) $y - 1 = 2x^2 - 1$ power function? Circle one: YES NO where k = _____ and p = ____

5.) $f(x) = \sqrt{\frac{25}{x^3}}$ power function? Circle one: YES NO where k = _____ and p = ____

6.) $y = \sqrt[4]{81x^2}$ power function? Circle one: YES NO where k = _____ and p = ____

7.) $f(x) = 6 \cdot 3^x$ power function? Circle one: YES NO where k = _____ and p = _____

8.) $y = 4(x - 2)(x + 2) + 16$ power function? Circle one: YES NO where k = _____ and p = _____

9.) $y = 2x^3 + 5$ power function? Circle one: YES NO where k = _____ and p = _____

10.) $y + 9 = (3 - 2x)(3 + 2x)$ power function? Circle one: YES NO where k = _____ and p = _____

II. Find an equation of a power function that goes through the given two points. SHOW WORK!!

11.) (3 , 30) and (1 , 5)	12.) (7 , 8) and (1 , 0.7)	13.) (6 , 17) and (1 , 2)
14.) (4 , 3) and (9 , 4.5)	15.) (6 , 162) and (8 , 384)	16.) $(2, \frac{64}{3})$ and (– 3 , 243)

III. Complete each variation problem. MUST SHOW WORK FOR CREDIT!!

17.) Suppose y is directly proportional to x. If y = 6 when x = 4, find the constant of proportionality (k). Write a formula for y then use it to find x when y = 8.	18.) Suppose y is inversely proportional to x. If y = 2 when x = 3, find the constant of proportionality (k). Write a formula for y then use it to find x when y = 8.
19.) Suppose c is directly proportional to the square of d. If c = 45 when d = 3, find the constant of proportionality (k). Write a formula for c then use it to find c when d = 5.	20.) Suppose h is inversely proportional to the cube of t. If h = .002 when t = 5, find the constant of proportionality (k). Write a formula for h then use it to find t when $h = \frac{-1}{108}$.

IV. Complete each application problem below. MUST SHOW WORK FOR CREDIT!!

21.) A 30-second commercial during Super Bowl XXXVI in 2002 cost advertisers 2 million dollars. For the first Super Bowl in 1967, an advertiser could have purchased approximately 22.989 minutes of advertising time for the same amount of money. Write a function that expresses the above situation.	22.) A person's weight, w, on a planet of radius d, is given by $w = k \cdot d^{-2}$ where the constant k depends on the masses of the person and the planet. A man weighs 180 lbs. on the surface of the earth. How much does he weigh on the surface of a planet whose mass is the same as the earth's, but whose radius is three times as large?