

Review for 3rd Exam

1. Give examples of the following power functions
 - a. For $x > 0$, graph passes through (1,6), is increasing and concave up. (2 pts.)

 - b. For $x > 0$, graph passes through (1,9), is increasing and concave down? (2 pts.)

 - c. For $x > 0$, graph passes through (1, 3), is decreasing and has asymptotes the positive x – axis and the positive y – axis. (2 pts.)

2. Which of the three functions $y_1 = x^4$, $y_2 = x^{-2}$, $y_3 = x^2$
 - a. Has the largest values on the interval $0 < x < 1$ (2 pts)
 - b. Has the smallest values on the interval $x > 1$ (2 pts)
 - c. Sketch the graphs of these power functions on $0 < x < 1$ (3 pts.)

3. Match each formula with its corresponding table of values (6 pts)
 - a. $f(x) = 3(1.06)^x$
 - b. $g(x) = 2x^{1.8}$
 - c. $h(x) = 5x^{0.62}$

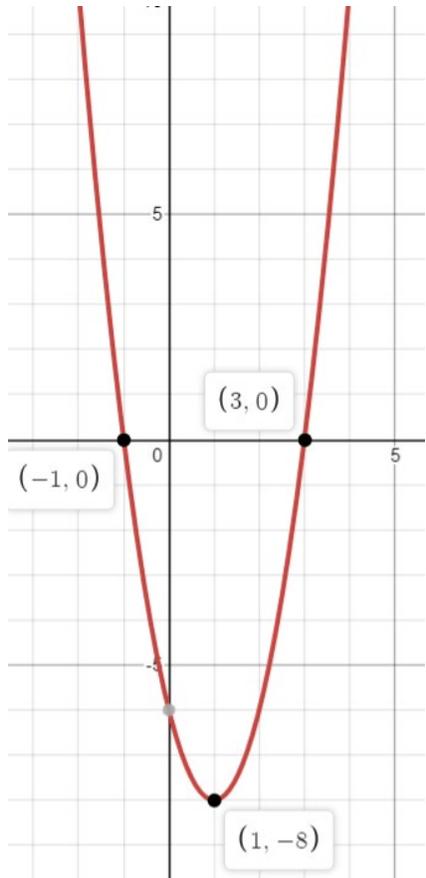
(i)	2	3	4	5	6
	13.929	43.348	97.006	181.19	301.89

(ii)	1	2	3	4	5
	5.00	7.6844	9.8806	11.81	13.562

(iii)	2	4	6	8	10
	3.3708	3.7874	4.2556	4.7815	5.3725

4. The relationship between the weight W (in pounds) and the wingspan S (in feet) of birds can be modeled by the power function $W = 0.15\sqrt[4]{S^9}$. The pterosaur weighed approximately 600 pounds. Estimate the wingspan of this prehistoric bird.
5. For each of the polynomials below determine its degree and its leading coefficient (2+2+2 pts)
- $P(x) = 2x^4 - 2x - 3$
 - $P(t) = 5 - 3t + 8t^2 - 12t^6$
 - $P(z) = z^3 + 2z^2 + 6z - 3$
6. For the polynomial $P(x) = x^4 - 5x^2 - 6$.
- Estimate all its zeros, correct to three decimal points
 - How many turning points does it have? Approximately for what value(s) of x do they occur?
 - How many inflection points does it have? Approximately for what value(s) of x do they occur?
 - How many complex solutions roots does the function have?
7. Factor completely $f(x) = 2(x^2 - 4)(x^2 - 25)$. Then sketch its graph.

8. Write a possible formula for the polynomial, assuming that what you see from the graph includes all the roots.



9. Consider the function $y = f(x) = x^3$.
- Write a formula for the function produced when f is stretched by a factor of 3 and then shifted down by 2 units. Call this new function F and sketch its graph.
 - What function do you get if you reverse the order of the two operations in part a) and first shift $f(x)$ down by 2 units and then stretch it by a factor of 3? Call this new function G and sketch it.
 - What is $F-G$?

10. Find the roots of the equation $x^2 + 2x + 10 = 0$ and then use those solutions to factor the function $f(x) = x^2 + 2x + 10$.