

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## 1.1 Power Functions

BLM 1-3

1. State the degree and the leading coefficient of each polynomial.

a)  $y = -2x^5 + 3x^3 - 1$

b)  $y = 3x + 5x^2$

c)  $y = \frac{x^4}{3} - 3x^3 + x - 6$

2. Complete the table for the following functions.

$y = 3x$

$y = -2x^7$

$y = -3x^4$

$y = 4x^5$

$y = -x^2$

$y = \frac{2}{3}x^6$

$y = -\frac{1}{6}x^3$

$y = 2x^{10}$

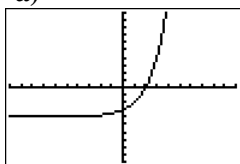
End Behaviour	Function	Reasons
Extends from quadrant 3 to quadrant 1		
Extends from quadrant 2 to quadrant 4		
Extends from quadrant 2 to quadrant 1		
Extends from quadrant 3 to quadrant 4		

3. Consider each graph.

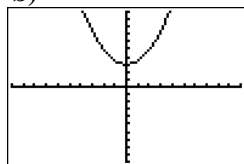
i) Does it represent a power function, an exponential function, a periodic function, or none of these?

ii) Identify any symmetry.

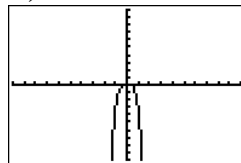
a)



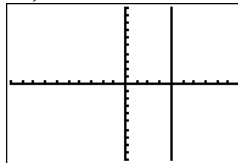
b)



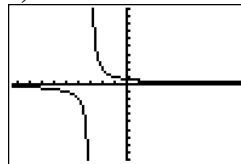
c)



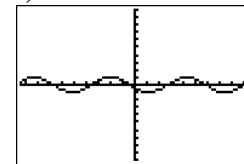
d)



e)



f)



4. a) Graph  $y = x^4$ ,  $y = -3x^4$ , and  $y = \frac{1}{2}x^4$  on

the same set of axes.

- b) Compare and describe the key features of the graphs.

5. a) Graph  $y = x^5$ ,  $y = (x + 3)^5$ , and  $y = (x - 3)^5$  on the same set of axes.

- b) Describe the similarities and differences among the graphs in part a).

- c) Make a conjecture about the relationship between the graphs of  $y = x^n$  and  $y = (x - h)^n$ , where  $h \in \mathbb{R}$  and  $n$  is an odd whole number.

6. The surface area of a spherical snowball is given by the function  $S(r) = 4\pi r^2$ , where  $r$  is the radius of the snowball, in centimetres, and  $r \in [0, 12]$ .

- a) Graph  $S(r)$ .

- b) State the domain and the range.

- c) Describe the similarities and differences between the graphs of  $S(r)$  and  $y = x^2$ .

7. a) Describe the relationship between the graph of  $y = x^3$  and the graph of

$$y = -\frac{1}{2}(x + 1)^3 - 4$$

- b) Predict the relationship between the graph of  $y = x^5$  and the graph of

$$y = -\frac{1}{2}(x + 1)^5 - 4$$

- c) Verify the accuracy of your prediction by graphing the functions in part b).