

1.1 Polynomial Power Functions Worksheet

This document was composed and formatted by Annie Bernatchez.

The course material originated from www.jensenmath.ca

1) Identify which of the following are polynomial functions:

a) $p(x) = \cos x$

b) $h(x) = -7x$

c) $f(x) = 2x^4$

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

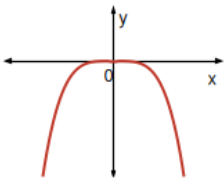
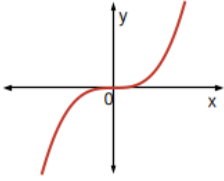
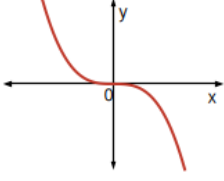
e) $k(x) = 8^x$

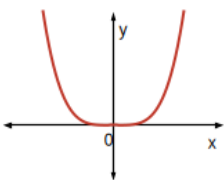
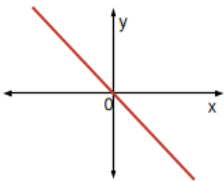
f) $y = x^{-3}$

2) State the degree and the leading coefficient of each polynomial

Polynomial	Degree	Leading Coefficient
$y = 5x^4 - 3x^3 + 4$		
$y = -x + 2$		
$y = 8x^2$		
$y = -\frac{x^3}{4} + 4x - 3$		
$y = -5$		
$y = x^2 - 3x$		

3) Complete the following table

Graph of Function	Even or Odd Degree?	Sign of Leading Coefficient	Domain and Range	Symmetry	End Behaviour
					
					
					

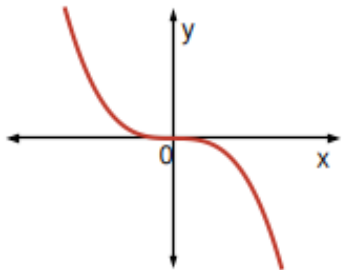
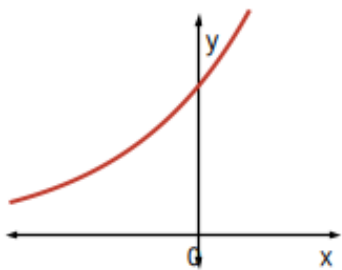
					
					

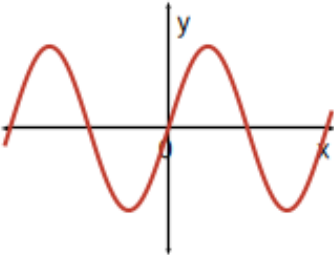
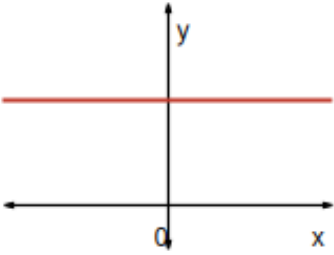
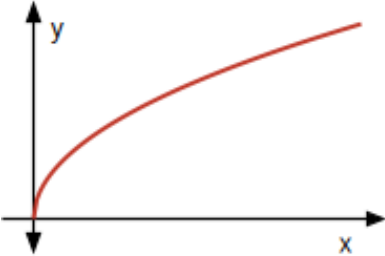
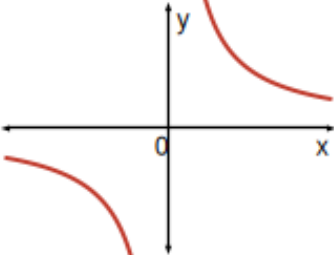
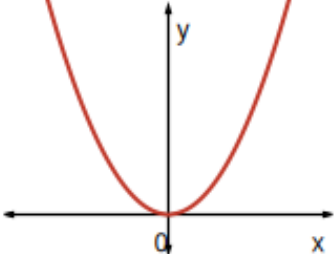
4) Match each function to its end behaviour

- $y = -x^3, y = \frac{3}{7}x^2, y = 5x$
- $y = 4x^5, y = -x^6, y = -0.1x^{11}$
- $y = 2x^4, y = -9x^{10}$

End Behaviour	Functions
Q3 to Q1	
Q2 to Q4	
Q2 to Q1	
Q3 to Q4	

5) Determine whether each graph represents a polynomial power function, exponential function, a periodic function, or none of these.

a)		
b)		

c)		
d)		
e)		
f)		
g)		

Answer Key

1)

- a) No
- b) Yes
- c) Yes
- d) Yes
- e) No
- f) No

2)

Polynomial	Degree	Leading Coefficient
$y = 5x^4 - 3x^3 + 4$	4	5
$y = -x + 2$	1	-1
$y = 8x^2$	2	8
$y = -\frac{x^3}{4} + 4x - 3$	3	$-\frac{1}{4}$
$y = -5$	0	-5
$y = x^2 - 3x$	2	1

3)

Graph 1: even, negative, D: $(-\infty, \infty)$, R: $(-\infty, 0]$, line symmetry, Q3 to Q4.

Graph 2: odd, positive, D/R: $(-\infty, \infty)$, point symmetry, Q3 to Q1.

Graph 3: odd, negative, D/R: $(-\infty, \infty)$, point symmetry, Q2 to Q4.

Graph 4: even, positive, D: $(-\infty, \infty)$, R: $[0, \infty)$, line symmetry, Q2 to Q1.

Graph 5: odd, negative, D/R: $(-\infty, \infty)$, point symmetry, Q2 to Q4.

4)

Q3 to Q1: $y = 4x^5$, $y = 5x$.

Q2 to Q4: $y = -x^3$, $y = -0.1x^{11}$.

Q2 to Q1: $y = 2x^4$, $y = \frac{3}{7}x^2$.

Q3 to Q4: $y = -x^6$, $y = -9x^{10}$.

5)

- a) Power
- b) Exponential
- c) Periodic
- d) Power
- e) None (square root)
- f) None (rational)
- g) Power