

**W1 – 1.1 – Power Functions**

MHF4U

Jensen

ANSWERS

1) Identify which of the following are polynomial functions:

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

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

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

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

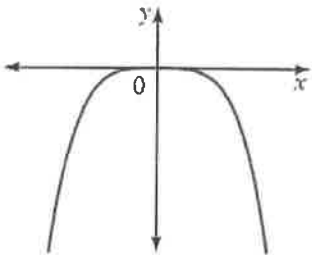
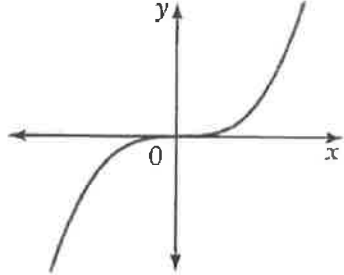
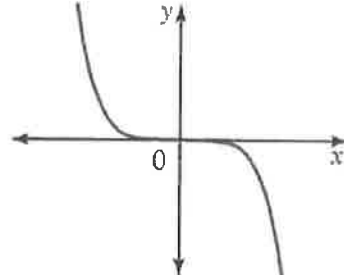
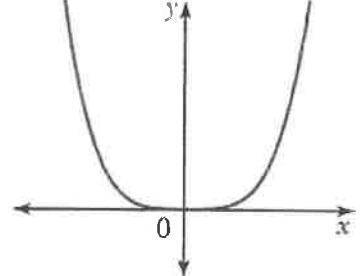
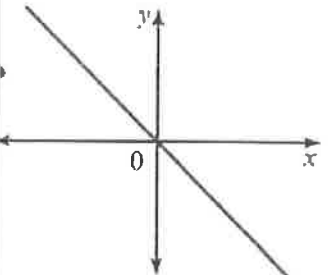
e)  $k(x) = 8^x$

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

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

Polynomial	Degree	Leading Coefficient
$y = 5x^4 - 3x^3 + 4$	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) Complete the following table

Graph of Function	Even or Odd Degree?	Sign of Leading Coefficient	Domain and Range	Symmetry	End Behaviour
	Even	-	$D: \{x \in \mathbb{R}\}$ $R: \{y \in \mathbb{R} \mid y \leq 0\}$	Line	Q3 to Q4
	Odd	+	$D: \{x \in \mathbb{R}\}$ $R: \{y \in \mathbb{R}\}$	Point	Q3 to Q1
	Odd	-	$D: \{x \in \mathbb{R}\}$ $R: \{y \in \mathbb{R}\}$	Point	Q2 to Q4
	Even	+	$D: \{x \in \mathbb{R}\}$ $R: \{y \in \mathbb{R} \mid y \geq 0\}$	Line	Q2 to Q1
	Odd	-	$D: \{x \in \mathbb{R}\}$ $R: \{y \in \mathbb{R}\}$	Point	Q2 to Q4

4) Match each function to its end behavior

$$y = -x^3 \checkmark$$

$$y = \frac{3}{7}x^2 \checkmark$$

$$y = 5x \checkmark$$

$$y = 4x^5 \checkmark$$

$$y = -x^6 \checkmark$$

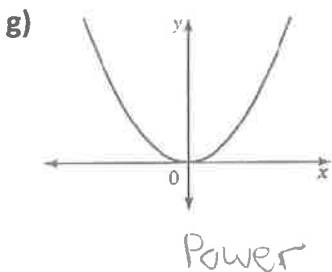
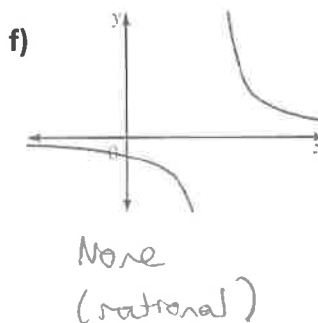
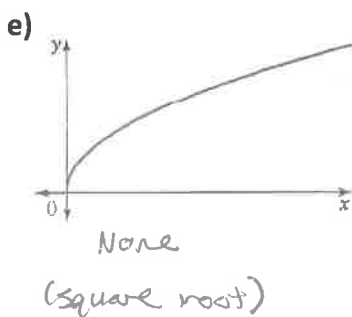
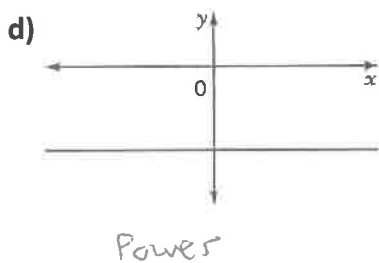
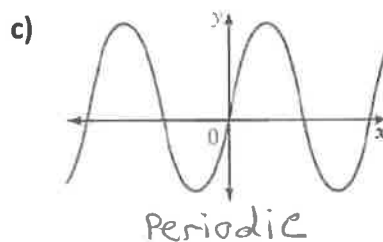
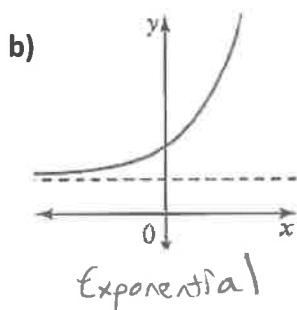
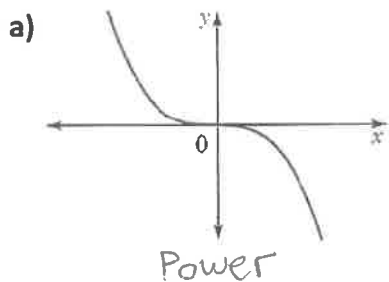
$$y = -0.1x^{11} \checkmark$$

$$y = 2x^4 \checkmark$$

$$y = -9x^{10} \checkmark$$

End Behaviour	Functions
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) Determine whether each graph represents a power function, exponential function, a periodic function, or none of these.



## Answer Key

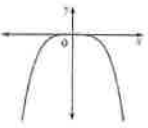
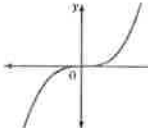
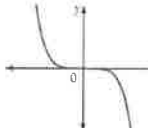
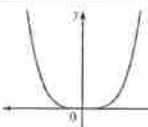
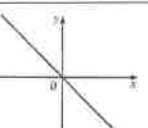
### W1

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

2)

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3)

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4)

End Behaviour	Functions
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