W1 – 1.1 – Power Functions
MHF4U

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

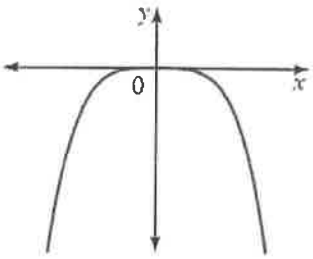
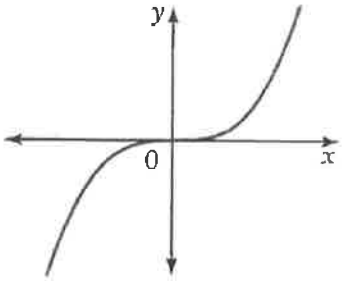
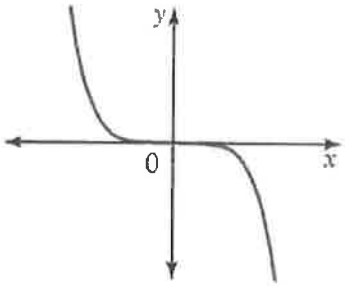
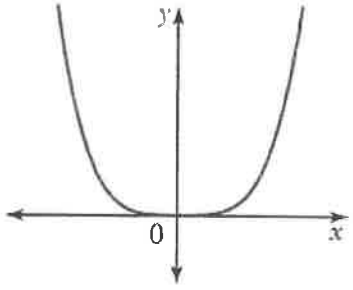
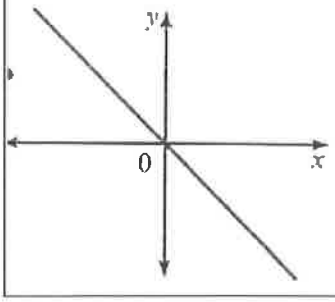
e) $k(x) = 8^x$

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

$y = -x^3$ ↘ $y = \frac{3}{7}x^2$ ↘ $y = 5x$ ↘

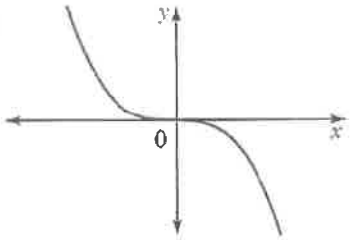
$y = 4x^5$ ↘ $y = -x^6$ ↘ $y = -0.1x^{11}$ ↘

$y = 2x^4$ ↘ $y = -9x^{10}$ ↘

End Behaviour	Functions
Q3 to Q1	$y=4x^5$, $y=5x$
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	$y=-x^6$, $y=-9x^{10}$

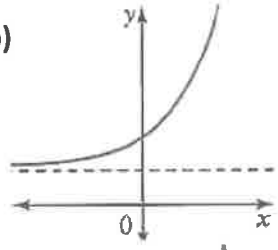
5) Determine whether each graph represents a power function, exponential function, a periodic function, or none of these.

a)



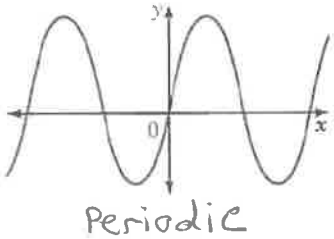
Power

b)



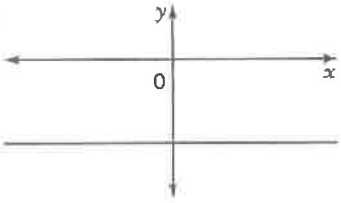
Exponential

c)



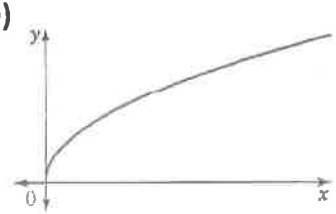
Periodic

d)



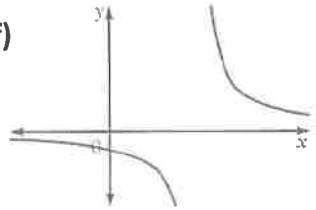
Power

e)



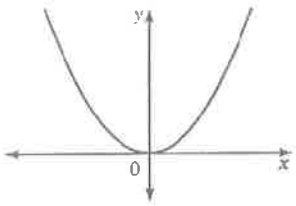
None
(square root)

f)



None
(rational)

g)



Power

Answer Key

W1

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

2)

Polynomial	Degree	Leading Coefficient
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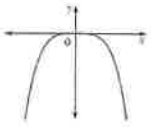
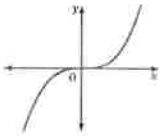
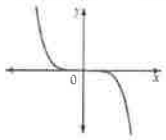
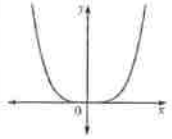
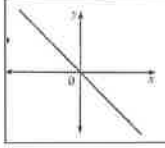
3)

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

4)

End Behaviour	Functions
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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