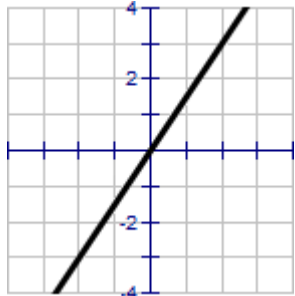
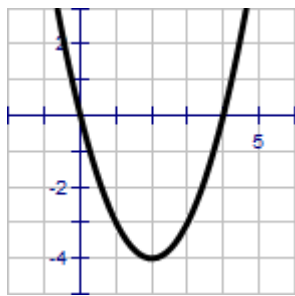
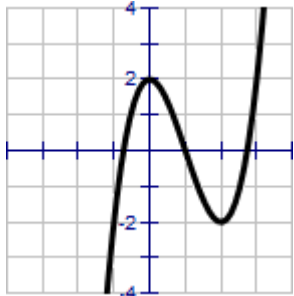
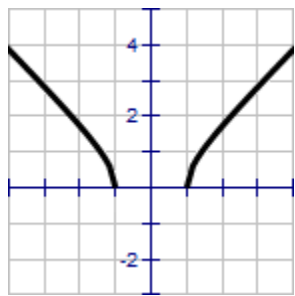
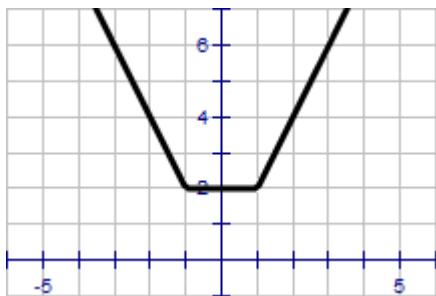
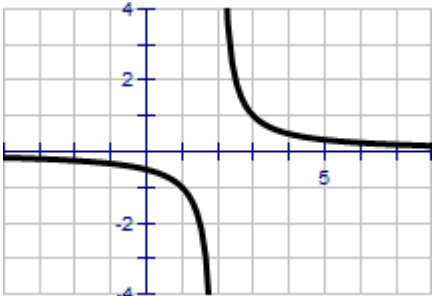
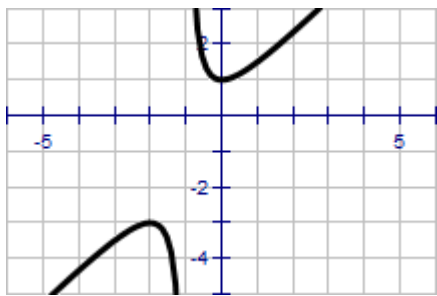
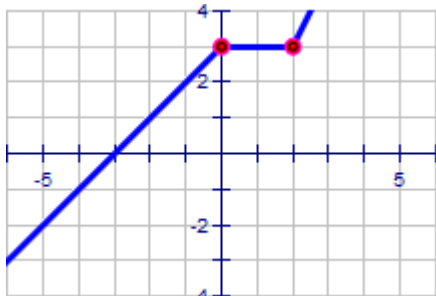
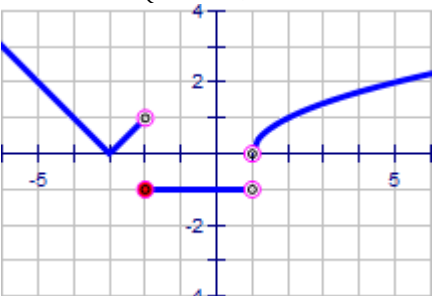
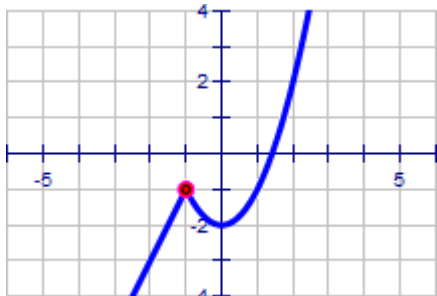


UNIT 2: Polynomial Functions – SECTION 1 WORKSHEET

Directions: Determine the intervals over which the function is increasing, decreasing, or constant.

1.) $f(x) = \frac{3}{2}x$ 	2.) $f(x) = x^2 - 4x$ 	3.) $f(x) = x^3 - 3x^2 + 2$ 	4.) $f(x) = \sqrt{x^2 - 1}$ 
INCREASING	INCREASING	INCREASING	INCREASING
$(-\infty, \infty)$	$(2, \infty)$	$(-\infty, 0) \cup (2, \infty)$	$(1, \infty)$
DECREASING	DECREASING	DECREASING	DECREASING
NONE	$(-\infty, 2)$	$(0, 2)$	$(-\infty, -1)$
CONSTANT	CONSTANT	CONSTANT	CONSTANT
NONE	NONE	NONE	NONE

5.) $f(x) = x + 1 + x - 1 $ 	6.) $f(x) = \frac{1}{x-2}$ 	7.) $f(x) = \frac{x^2+x+1}{x+1}$ 
INCREASING	INCREASING	INCREASING
$(1, \infty)$	NONE	$(-\infty, -2) \cup (0, \infty)$
DECREASING	DECREASING	DECREASING
$(-\infty, -1)$	$(-\infty, 2) \cup (2, \infty)$	$(-2, -1) \cup (-1, 0)$
CONSTANT	CONSTANT	CONSTANT
$(-1, 1)$	NONE	NONE

8.) $f(x) = \begin{cases} x + 3, & x \leq 0 \\ 3, & 0 < x \leq 2 \\ 2x - 1, & x > 2 \end{cases}$ 	9.) $f(x) = \begin{cases} x + 3 , & x < -2 \\ -1, & -2 \leq x < 1 \\ \sqrt{x - 1}, & x > 1 \end{cases}$ 	10.) $f(x) = \begin{cases} 2x + 1, & x \leq -1 \\ x^2 - 2, & x > -1 \end{cases}$ 
INCREASING	INCREASING	INCREASING
$(-\infty, 0) \cup (2, \infty)$	$(-3, -2) \cup (1, \infty)$	$(-\infty, -1) \cup (0, \infty)$
DECREASING	DECREASING	DECREASING
NONE	$(-\infty, -3)$	$(-1, 0)$
CONSTANT	CONSTANT	CONSTANT
$(0, 2)$	$[-2, 1)$	NONE

Directions: Determine whether the function is even, odd, or neither. Then describe the symmetry.

11.) $f(x) = x^6 - 2x^2 + 3$

EVEN; y-axis symmetry

12.) $f(x) = x^3 - 5$

NEITHER

13.) $f(x) = x^3 - 5x$

ODD; origin symmetry

14.) $f(x) = x\sqrt{1-x^2}$

ODD; origin symmetry

15.) $f(t) = t^2 + 2t - 3$

NEITHER

16.) $f(s) = 4s^{\frac{2}{3}}$

EVEN; y-axis symmetry

Directions: Match the polynomial function with its graph.

C 17.) $f(x) = -2x + 3$

G 18.) $f(x) = x^2 - 4x$

H 19.) $f(x) = -2x^2 - 5x$

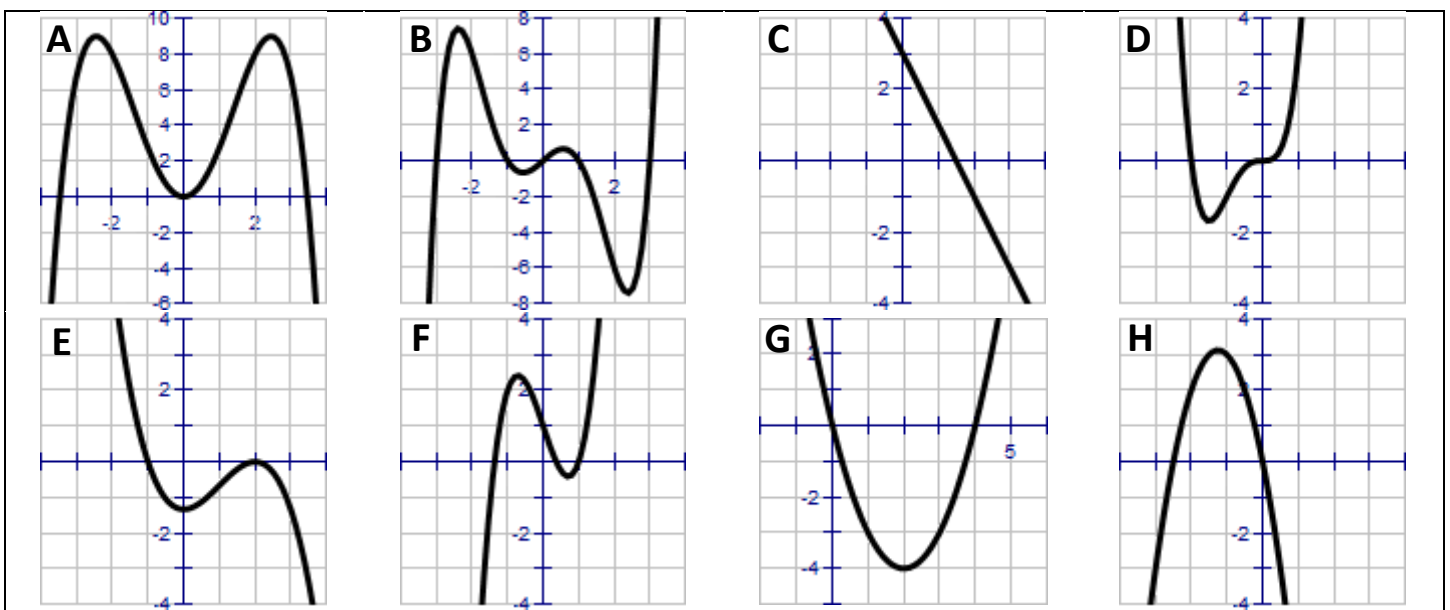
F 20.) $f(x) = 2x^3 - 3x + 1$

A 21.) $f(x) = -\frac{1}{4}x^4 + 3x^2$

E 22.) $f(x) = -\frac{1}{3}x^3 + x^2 - \frac{4}{3}$

D 23.) $f(x) = x^4 + 2x^3$

B 24.) $f(x) = \frac{1}{5}x^5 - 2x^3 + \frac{9}{5}x$



Directions: Describe the right-hand and left-hand end behavior of the graph of the polynomial function.

25.) $f(x) = \frac{1}{3}x^3 + 5x$

$x \rightarrow \infty \quad f(x) \rightarrow \underline{\infty}$

$x \rightarrow -\infty \quad f(x) \rightarrow \underline{-\infty}$

26.) $f(x) = 2x^2 - 3x + 1$

$x \rightarrow \infty \quad f(x) \rightarrow \underline{\infty}$

$x \rightarrow -\infty \quad f(x) \rightarrow \underline{\infty}$

27.) $g(x) = 5 - \frac{7}{2}x - 3x^2$

$x \rightarrow \infty \quad g(x) \rightarrow \underline{-\infty}$

$x \rightarrow -\infty \quad g(x) \rightarrow \underline{-\infty}$

28.) $h(x) = 1 - x^6$

$x \rightarrow \infty \quad h(x) \rightarrow \underline{-\infty}$

$x \rightarrow -\infty \quad h(x) \rightarrow \underline{-\infty}$

29.) $f(x) = -2.1x^5 + 4x^3 - 2$

$x \rightarrow \infty \quad f(x) \rightarrow \underline{-\infty}$

$x \rightarrow -\infty \quad f(x) \rightarrow \underline{\infty}$

30.) $f(x) = 2x^5 - 5x + 7.5$

$x \rightarrow \infty \quad f(x) \rightarrow \underline{\infty}$

$x \rightarrow -\infty \quad f(x) \rightarrow \underline{-\infty}$

31.) $f(x) = 6 - 2x + 4x^2 - 5x^3$

$x \rightarrow \infty \quad f(x) \rightarrow \underline{-\infty}$

$x \rightarrow -\infty \quad f(x) \rightarrow \underline{\infty}$

32.) $h(t) = -\frac{2}{3}(t^2 - 5t + 3)$

$x \rightarrow \infty \quad h(t) \rightarrow \underline{-\infty}$

$x \rightarrow -\infty \quad h(t) \rightarrow \underline{-\infty}$

33.) $f(x) = -\frac{7}{8}(s^3 + 5s^2 - 7x + 1)$

$x \rightarrow \infty \quad f(s) \rightarrow \underline{-\infty}$

$x \rightarrow -\infty \quad f(s) \rightarrow \underline{\infty}$