

*****Calculator Section*****

Use the function given to solve.

$f(x) = 3x^2 + 2x + 4$	$g(x) = \sqrt{\frac{2}{x-1}}$
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- 1) $f(0)$ 4 2) $f(-x)$ $3x^2 - 2x + 4$ 3) $f(x-1)$ $3x^2 - 4x + 5$
- 4) $g(1)$ und 5) $g(9)$ $\frac{1}{2}$ 6) $g(11)$ $\frac{\sqrt{5}}{5}$

Graph each function. Find the open intervals on which the function is increasing, decreasing, & constant.

- 7) $f(x) = |x-3| + |x+2|$ Increasing: $(-\infty, -2)$ Decreasing: $(-2, 3.5)$ Constant: $(3.5, \infty)$

Find all local maxima and minima. (Round to four decimal places)

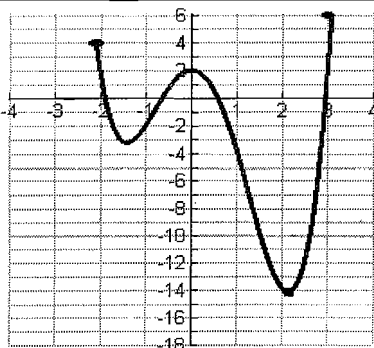
- 8) $g(x) = x^3 - 4x + 2$ Maxima: $(-1.1547, 5.0792)$ Minima: $(1.1547, -1.0792)$

Find the open intervals on which the function is:

- 9) $g(x) = x^3 - 4x + 2$ Concave Up: $(2, \infty)$ Concave Down: $(-\infty, 2)$ Pt. of Inflection: $(0, 2)$

*****Non Calculator Section*****

Use the graph below to answer the following:



- 10) What is the domain of the function? $[-2, 3]$
- 11) What is the range of the function? $-14 \leq y \leq 6$
- 12) $f(0) = 2$
- 13) $f(3) = 0$
- 14) $f(-1) + f(1) = -5$
 $-2 + -3$

Compute and simplify using the difference quotient and show all work on a separate sheet of paper.

- 15) $f(x) = 4x + 3$ $f(x) = 4$ 16) $f(x) = x^2 - x + 4$ $f(x) = 2x - 1$

Find the domain of the following functions. Write in interval notation.

- 17) $f(x) = \frac{x}{x^2 - 9}$ 18) $f(x) = \sqrt{3x - 12}$ 19) $f(x) = \frac{\sqrt{x+5}}{x-5}$ $(-\infty, 5) \cup (5, \infty)$
- $(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$ $[4, \infty)$
- 20) $f(x) = x^2 + |x|$ 21) $f(x) = \frac{2}{x^2 + 1}$ 22) $f(x) = \sqrt{-x} + \frac{1}{x+3}$
- $(-\infty, \infty)$ $(-\infty, \infty)$ $(-\infty, -3) \cup (-3, 0]$

Find the following for this piecewise function: $f(x) = \begin{cases} -x+1 & \text{if } x \leq -5 \\ [x]+5 & \text{if } -5 < x \leq 2 \\ x^2-2 & \text{if } 2 < x < 7 \end{cases}$

23) $f(-5)$ 4

24) $f(1.7)$ 6

25) $f(-2.4)$ 3

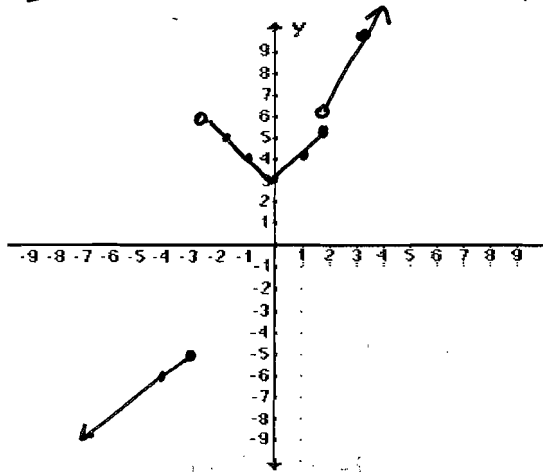
26) $f(8)$ DNE

27) Domain of $f(x)$ in interval notation $(-\infty, 7)$

Graph the following piecewise function:

28) $f(x) = \begin{cases} -x-2 & \text{if } x \leq -3 \\ |x|+3 & \text{if } -3 < x \leq 2 \\ x^2+2 & \text{if } x < 2 \end{cases}$

-4	-x-2	x +3	x ² +1
-3	-5	6	
-2		5	
-1		4	
0		3	
1		4	
2		5	6
3			10



Determine the characteristics of quadratic functions. Sketch a graph with at least five points...

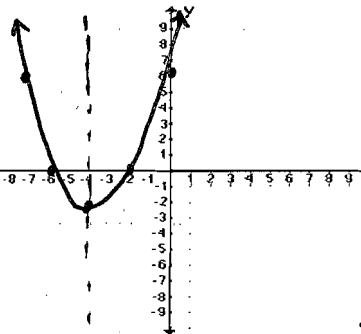
29) $f(x) = \frac{1}{2}(x+4)^2 - 2$

Vertex: $(-4, -2)$

AOS: $x = -4$

Zeros: $(-2, 0) + (-6, 0)$

Y-int.: $(0, 6)$



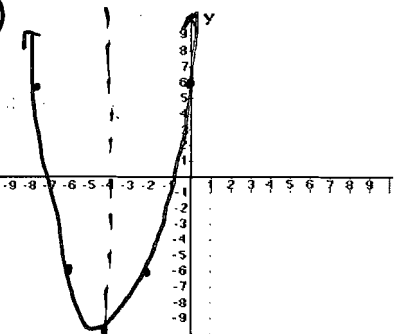
30) $g(x) = x^2 + 8x + 6$

Vertex: $(-4, -10)$

AOS: $x = -4$

Zeros: $(-4 \pm \sqrt{10}, 0)$

Y-int.: $(0, 6)$



-8	6
-6	6
-4	-2
-2	0
0	6

31) $f(x) = -2(x+3)(x+1)$

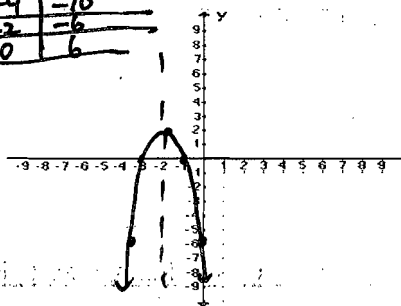
Vertex: $(-2, 2)$

AOS: $x = -2$

Zeros: $(-1, 0) + (-3, 0)$

Y-int.: $(0, -6)$

-8	6
-6	-6
-4	-10
-2	-6
0	6



Write in x-intercept form.

32) $f(x) = -2x^2 + 5x + 3$

$f(x) = -(2x+1)(x-3)$

Write in transformation form/vertex.

33) $f(x) = x^2 - 6x + 5$

$y = (x-3)^2 + 4$

34) $f(x) = 3x^2 - 12x + 6$

$f(x) = 3(x-2)^2 - 6$

35) Write a rule in transformation form of the quadratic function whose graph is the parabola with the vertex of

$(-4, 2)$ that passes through the point $(0, -2)$

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