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Date ________________
Algebra II

Finding Key Points

1. Given the function $f(x)=x^3+3x^2-x-2$, find the zeros and relative extrema to the *nearest tenth.*

Zeros
-3.1
-.7
.9

Maximum
(-2.2, 4.1)

minimum
(.2, -2.1)

2. Given the function $f(x)=-x^3-2x^2+2x+3$, find the zeros and relative extrema to the *nearest tenth.*

Zeros
-2.3
-1
1.3

Maximum
(.4, 3.4)

minimum
(-1.7, -1.3)

3. Given the function $f(x)=x^4-8x^2+x+8$, find the zeros and relative extrema to the *nearest tenth.*

Zeros
-2.7
-1
1.2
2.5

Maximum
(.1, 8.0)

Minimum
(-2.0, -10.0)
(2.0, 6.0)

4. Given the function $f(x)=-x^4+3x^2-1$, find the zeros and relative extrema to the *nearest tenth.*

Zeros
-1.6
-.6
.6
1.6

Maximum
(-1.2, 1.25)
(1.2, 1.25)

Minimum
(0, -1)

* 4.7817E-7 = 0
.00000047817

5. Given the function $f(x)=2x^3-11x^2-14x+26$, find the zeros and relative extrema to the *nearest tenth*

Zeros	Maximum	Minimum
-1.9	(-.6, 30.0)	(4.2, -78.7)
1.1		
6.3		

* y min: -80
y max: 80

6. Given the function $f(x)=-3x^3-20x^2-10x+8$, find the zeros and relative extrema to the *nearest tenth.*

Zeros	Maximum	Minimum
-6.0	(-.3, 9.3)	(-4.2, -80.5)
-1.0		
.4		

* y min: -100
y max: 10

7. Given the function $f(x)=-x^4+15x^2-7$, find the zeros and relative extrema to the *nearest tenth.*

Zeros	Maximum	Minimum
-3.8	(-2.7, 49.3)	(0, -7)
-.7	(2.7, 49.3)	
.7		
3.8		

* y min: -30
y max: 80

* -8.206E-7 = 0
.0000008206

8. Given the function $f(x)=x^3+8x^2+3x-8$, find the zeros and relative extrema to the *nearest tenth*

Zeros	Maximum	Minimum
-7.5	(-5.1, 52.1)	(-.2, -8.3)
-1.3		
.8		

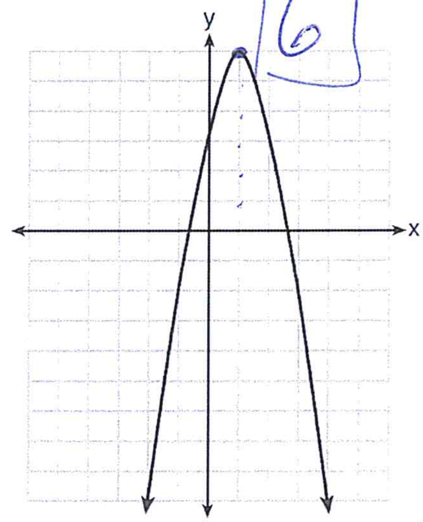
* y max: 80

9. Let f be the function represented by the graph below.

Let g be a function such that $g(x) = -\frac{1}{2}x^2 + 4x + 3$. type into Calc

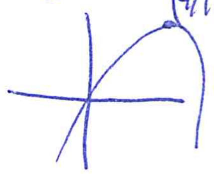
Determine which function has the larger maximum value. Justify your answer.

g value



$\boxed{6}$

g(x)



(4,11) $\boxed{11}$ $\boxed{g(x)}$

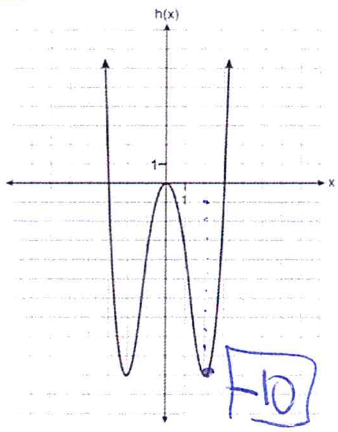
10. Which graph has a smaller relative minimum?

$g(x) = x^3 + 4x^2 - 2x - 10$

2nd Trace (minimum)

(.23, -10.23)

$\boxed{-10.23}$



$\boxed{-10}$

g(x) is smaller

11. Which graph has the largest zero?

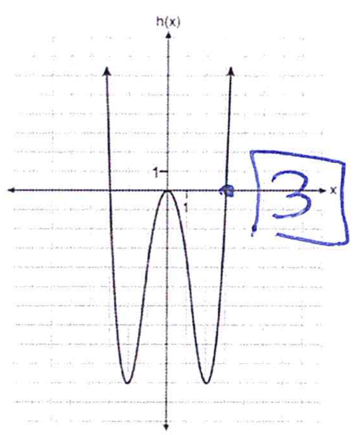
$\boxed{h(x)}$

$g(x) = x^3 + 4x^2 - 2x - 10$

2nd Trace (zero ~~minimum~~)

~~(.23, -10.23)~~

1.5



$\boxed{3}$

12. Which quadratic function has the largest maximum?

1) $h(x) = (3 - x)(2 + x)$ 2nd Trace: max 6.25

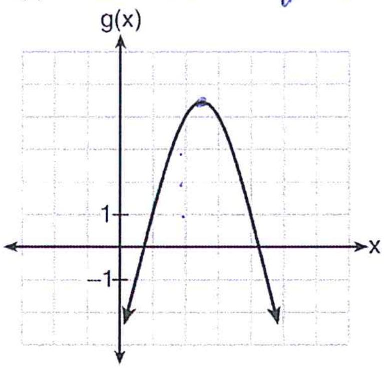
2)

x	f(x)
−1	−3
0	5
1	9
2	9
3	5
4	−3

≈ 9.5

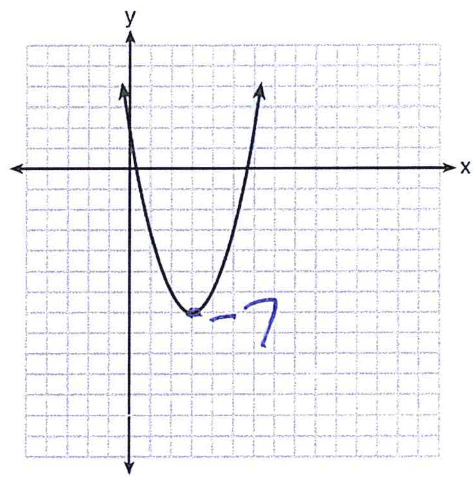
3) $k(x) = -5x^2 - 12x + 4$ 2nd Trace: max 11.2

4)



≈ 4.5

13. The graph representing a function is shown below.



Which function has a minimum that is *less* than the one shown in the graph?

2nd Trace min

1) $y = x^2 - 6x + 7$ −2
2) $y = |x + 3| - 6$ −2
3) $y = x^2 - 2x - 10$ −11
4) $y = |x - 8| + 2$ 2

$-11 < -7$

14. Which of the following functions has the greatest zero? 2nd Trace: Zero

$f(x) = x^2 - 6x + 7$ 4.4

$g(x) = x^2 - 2x - 10$ 4.3

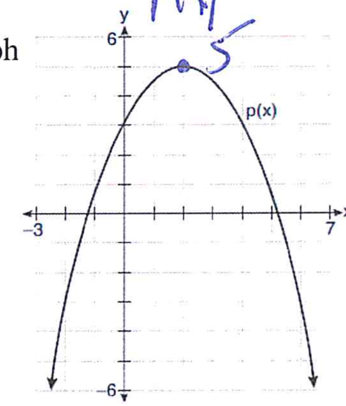
$\boxed{f(x)}$

2^{nd} Trace(min) $-.75, -5.25$

P(x)

15. Consider $f(x) = 4x^2 + 6x - 3$, and $p(x)$ defined by the graph below. The difference between the values of the maximum of p and minimum of f is subtraction

1) 0.25
2) 1.25
3) 3.25
4) 10.25



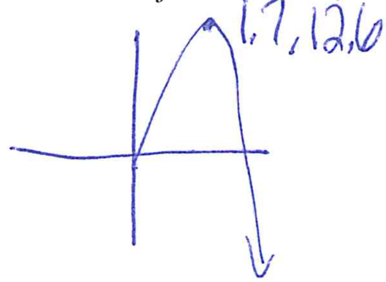
5

maximum of P	minimum of f
5	-5.25

$5 - {-5.25} = 10.25$

16. The function $v(x) = x(3 - x)(x + 4)$ models the volume, in cubic inches, of a rectangular solid for $0 \le x \le 3$. To the *nearest tenth of a cubic inch*, what is the maximum volume of the rectangular solid?

X min: 0
X max: 3

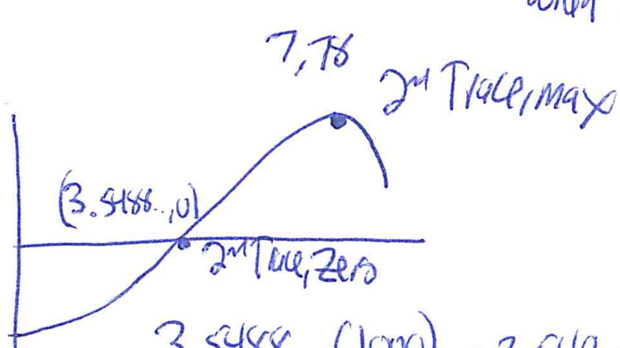


12.6

17. A manufacturer of sweatshirts finds that profits and costs fluctuate depending on the number of products created. Creating more products doesn't always increase profits because it requires additional costs, such as building a larger facility or hiring more workers. The manufacturer determines the profit, $p(x)$, in thousands of dollars, as a function of the number of sweatshirts sold, x, in thousands. This function, p, is given below. Over the interval $0 \le x \le 9$, state the coordinates of the maximum of p and round all values to the *nearest integer*. Explain what this point represents in terms of the number of sweatshirts sold and profit. Determine how many sweatshirts, to the *nearest whole sweatshirt*, the manufacturer would need to produce in order to first make a positive profit. Justify your answer.

$p(x) = -x^3 + 11x^2 - 7x - 69$

when 7,000 sweatshirts are sold, the maximum profit is \$78,000.



$3.5488..(1000) = 3549$ sweatshirts to first make a positive profit.