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Date _____
Algebra II

Key Points with TI Practice

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

Zeros
-3.11, .86
-.75

relative max
(-2.15, 4.08)

relative min
(.15, -2.08)

2. Given the function $f(x) = x^4 - 8x^2 + x + 8$, find the zeros and relative extrema to the nearest hundredth. What is the absolute minimum of the function?

Zeros
-2.70, 1.18
-1, 2.52

relative minimum
(-2.03, -10.02)
(1.97, -6.02)

relative maximum
(.06, 8.03)

Absolute min: (-2.03, -10.02)

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

Zeros
-7.15, .80
-1.34

relative max
(5.14, 52.14)

relative min
(-.19, -8.29)

4. The graphs of the equations $y = x^2 + 4x - 1$ and $y + 3 = x$ are drawn on the same set of axes. One solution of this system is

1) (-5, -2)
2) (-1, -4)

3) (1, 4)
4) (-2, -1)

5. When $g(x) = \frac{2}{x+2}$ and $h(x) = \log(x+1) + 3$ are graphed on the same set of axes, which coordinates best approximate their point of intersection?

- 1) (-0.9, 1.8) 3) (1.4, 3.3)
~~2) (-0.9, 1.9)~~ 4) (1.4, 3.4)

6. Which value, to the *nearest tenth*, is *not* a solution of $p(x) = q(x)$ if $p(x) = x^3 + 3x^2 - 3x - 1$ and $q(x) = 3x + 8$?

- 1) -3.9 3) 2.1
2) -1.1 ~~4) 4.7~~

7. To the *nearest tenth*, the value of x that satisfies $2^x = -2x + 11$ is

- 1) 2.5 3) 5.8
~~2) 2.6~~ 4) 5.9

8. If $f(x) = 3|x| - 1$ and $g(x) = 0.03x^3 - x + 1$, an approximate solution for the equation $f(x) = g(x)$ is

- 1) 1.96 3) (-0.99, 1.96)
~~2) 11.29~~ 4) (11.29, 32.87)

9. If $p(x) = 2\ln(x) - 1$ and $m(x) = \ln(x+6)$, then what is the solution for $p(x) = m(x)$?

- 1) 1.65 ~~3) 5.62~~
2) 3.14 4) no solution

10. For which values of x , rounded to the *nearest hundredth*, will $|x^2 - 9| - 3 = \log_3 x$?

- ~~1) 2.29 and 3.63~~ 3) 2.84 and 3.17
2) 2.37 and 3.54 4) 2.92 and 3.06

$$x = 2.29$$

$$x = 3.63$$

11. Given: $h(x) = \frac{2}{9}x^3 + \frac{8}{9}x^2 - \frac{16}{13}x + 2$

$k(x) = -|0.7x| + 5$

State the solutions to the equation $h(x) = k(x)$, rounded to the nearest hundredth.

$x = -5.17 \quad x = -1.13 \quad x = 1.75$

12. For a fundraiser, members of the math club decide to make and sell t-shirts. Their profit

$p(x)$ can be modeled by the function $p(x) = -\frac{1}{78}(x^3 - 53x^2 - 236x + 9828)$ where x is the

number of t-shirts sold. How many t-shirts would they have to sell to make their maximum profit? How many t-shirts would they have to sell to break even? Round all answers to the nearest unit.

maximum

$(37.43, 266.91)$

37 t-shirts

zero
(540)

54 t-shirts

13. The function below models the average price of gas in a small town since January 1st.

$G(t) = -0.0049t^4 + 0.0923t^3 - 0.56t^2 + 1.166t + 3.23$, where $0 \leq t \leq 10$.

If $G(t)$ is the average price of gas in dollars and t represents the number of months since January 1st, the absolute maximum $G(t)$ reaches over the given domain is about

1) \$1.60

2) \$3.92

3) \$4.01

4) \$7.73

local max
(16, 4.01)

local max
(7.73, 3.92)

14. Sally's high school is planning their spring musical. The revenue, R , generated can be determined by the function $R(t) = -33t^2 + 360t$, where t represents the price of a ticket. The production cost, C , of the musical is represented by the function $C(t) = 700 + 5t$. What is the highest ticket price, to the nearest dollar, they can charge in order to *not* lose money on the

event?

2nd ~~zero~~ intersection

intersection

$(8.16, 740.8)$

$t = 18$

