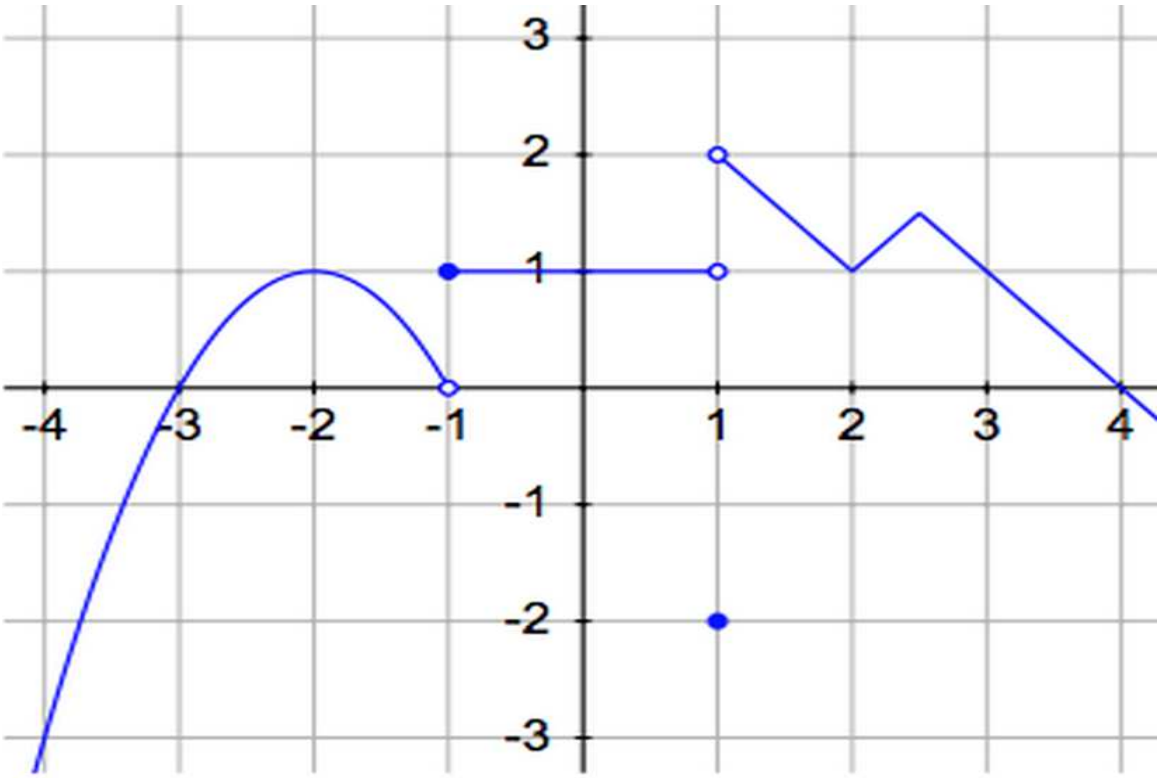
Name_____ Date_____ Period_____

PreAP Precalculus

TEST Chapter 2.1-2.3 + Inverse, Form A. **No Calculator**

Part I: Multiple Choice, Put your **CAPITAL LETTER** answer choice in the blank to the left of the number.

Use the graph of $f(x)$ below for $-4 \le x \le 4$ to answer questions 1- 4.



_____ 1. $f(x)$ has a local (relative) maximum of

(A) -2 (B) 2 (C) 3 (D) 1 (E) $f(x)$ has no local (relative) maximum

_____ 2. $\lim_{x \to 0} f(x) =$

(A) 1 (B) 0 (C) 2 (D) DNE (E) $-\infty$

_____ 3. $\lim_{x \to 1^-} f(x) =$

(A) -2 (B) 1 (C) 0 (D) 2 (E) DNE

_____ 4. $f(x)$ is monotonic (strictly) increasing on which of the following given intervals?

(A) $(2,4)$ (B) $(-1,1)$ (C) $(2,3)$ (D) $(1,2)$ (E) $(-3,-2)$

_____ 5. If $A(x) = 5\sqrt{2x+1}$, find the average rate of change of $A(x)$ on the interval $x \in [4,12]$.

(A) $\frac{5}{4}$ (B) $-\frac{5}{4}$ (C) $\frac{4}{5}$ (D) $-\frac{4}{5}$ (E) $\frac{1}{8}$

_____ 6. If $f(x)=\dfrac{5x-1}{3-2x}$, what is the domain of $f^{-1}(x)$, the inverse of f?

(A) $D_{f^{-1}}:\left(-\infty,\dfrac{5}{3}\right)\cup\left(\dfrac{5}{3},\infty\right)$ (B) $D_{f^{-1}}:\left(-\infty,\dfrac{3}{2}\right)\cup\left(\dfrac{3}{2},\infty\right)$ (C) $D_{f^{-1}}:\left(-\infty,-\dfrac{3}{2}\right)\cup\left(-\dfrac{3}{2},\infty\right)$

(D) $D_{f^{-1}}:\left(-\infty,-\dfrac{5}{2}\right)\cup\left(-\dfrac{5}{2},\infty\right)$ (E) $D_{f^{-1}}:\left(-\infty,\dfrac{2}{3}\right)\cup\left(\dfrac{2}{3},\infty\right)$

_____ 7. $\lim\limits_{x\to\infty}\dfrac{222x^{222}-22x^{22}+2}{3x^3+33x^{33}-333x^{333}}=$

(A) $\dfrac{222}{-333}$ (B) $\dfrac{222}{3}$ (C) 0 (D) $-\infty$ (E) ∞

_____ 8. Which of the following is **NOT** true about $f(x)=\dfrac{(x+5)(x-3)(x+1)}{x^2-3x-40}$

(A) $f(x)$ has a vertical asymptote at $x=8$ (B) $f(x)$ has a hole at $\left(-5,\dfrac{-32}{13}\right)$ (C) $\lim\limits_{x\to-\infty}f(x)=\infty$

(D) $f(x)$ has an x-intercept $x=-1$ (E) $f(x)$ has an x-intercept $x=3$

_____ 9. The function $g(x)=\begin{cases}x^2-8, & x<-2\\ -4, & x=-2\\ 5-\sqrt{x^3+89}, & x>-2\end{cases}$

(A) has a jump at $x=-2$ (B) has a hole at $x=-2$ (C) has a vertical asymptote at $x=-2$

(D) is continuous at $x=-2$ (E) has a horizontal asymptote at $y=5$

Part II: Free Response

Show all work in the space provided. As always, use proper notation, and show the work that leads to your answer. Remember that on this section, your PROCESS is as important as your PRODUCT. Given

$P(x) = 3x^2 - 2x - 8$ $\quad T(x) = 2x^2 + 3x^4 - 4x^6 + 5x^8$ $\quad R(x) = x^2 + 3x - 10$ $\quad V(x) = -9x^5 + 8x^3 + 7x + 6$

10. Let $Z(x) = \dfrac{P(x)}{R(x)}$

(a) Find the domain of $Z(x)$.

(b) Find the **equation(s)** of any vertical asymptote(s) of $Z(x)$.

(c) Find the **coordinate**, (x, y), of any removable point discontinuity of $Z(x)$.

(d) Find the **equation** of any horizontal asymptote(s) of $Z(x)$.

(e) Find the **coordinate(s)**, (x, y), of any x-intercept(s) of $Z(x)$.

11. Let $N(x)=\dfrac{T(x)}{V(x)}$

(a) Is $N(x)$ even, odd, or neither. Justify.

(b) $\lim\limits_{x\to -\infty} N(x)=$

(c) Find the coordinate, (x, y), of the y-intercept of $N(x)$.