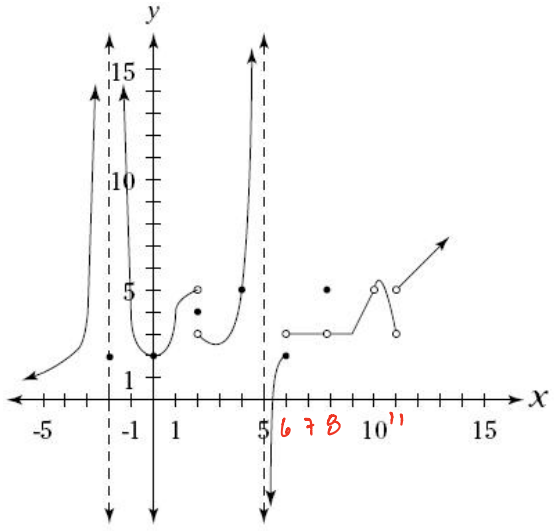
Name KEY Date Period

PCPAP TEST: Chapter 1.1-2.2 Form A
No Calculator

Part I: Multiple Choice. Put the CAPITAL letter in each blank to the left of the problem number.

The graph of $g(x)$ is give at right. Use the graph to answer questions 1-4.



C 1. $\lim_{x\to 2^-} g(x) =$ (A) 3 (B) 4 (C) 5 (D) 6 (E) DNE

E 2. $\lim_{x\to 6} g(x) =$ (A) 2 (B) 3 (C) 4 (D) 5 (E) DNE

A 3. $\lim_{x\to 8} g(x) =$ (A) 3 (B) 4 (C) 5 (D) 6 (E) DNE

E 4. $g(11) =$ (A) 3 (B) 4 (C) 5 (D) 6 (E) DNE

B 5. The function $f(x) = \dfrac{x(x-1)(x+2)(x-3)(x+4)}{(x+1)(x+2)(x+3)(x-4)}$ has a removable point discontinuity at

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

C 6. If $f(x) = \dfrac{-3}{x-2}$ and $g(x) = \sqrt{x+3}$, what is the domain of $h(x) = f(g(x))$? $x \geq -3$, $x \neq 1$

(A) $(-3,\infty)$ (B) $[-3,\infty)$ (C) $[-3,1)\cup(1,\infty)$ (D) $[-3,-1)\cup(-1,\infty)$ (E) $(-\infty,-1)\cup(-1,\infty)$

C 7. Expand and simplify the following: $\left(4\sqrt{x} - 3x^2\right)\left(\dfrac{2}{x^2} - 4\right) = 8x^{-3/2} - 16x^{1/2} - 6 + 12x^2$, $\dfrac{8}{\sqrt{x^3}} - 16\sqrt{x} - 6 + 12x^2$

(A) $\dfrac{8}{\sqrt{x^3}} - 16\sqrt{x} - 6x + 12x^2$ (B) $\dfrac{8}{\sqrt[3]{x^2}} - 16\sqrt{x} - 6 + 12x^2$ (C) $\dfrac{8}{\sqrt{x^3}} - 16\sqrt{x} - 6 + 12x^2$

(D) $\dfrac{8}{\sqrt[3]{x^2}} - 16\sqrt{x} - 6x + 12x^2$ (E) $\dfrac{8 - 16\sqrt{x} - 6 + 12x^2}{\sqrt{x^3}}$

A 8. Simplify: $\dfrac{4x^2y^{-2} + 3x^{-2}y^3}{xy^{-1} + 2x}$ $\dfrac{\frac{4x^2}{y^2} + \frac{3y^3}{x^2}}{\frac{x}{y} + 2x}\left(\frac{x^2y^2}{x^2y^2}\right) = \dfrac{4x^4 + 3y^5}{x^3y + 2x^3y^2}$

(A) $\dfrac{4x^4 + 3y^5}{x^3y + 2x^3y^2}$ (B) $\dfrac{4x^4\sqrt{y} + 3\sqrt{x}y^4}{1 + 2y}$ (C) $\dfrac{4x^4y + 3xy^4}{1 + 2x^3y}$ (D) $\dfrac{4xy + 3y^2}{x^2y + 2x^2}$ (E) $\dfrac{4x^4 + 3y^5}{2x^3y + x^3y^2}$

D 9. Find the domain of $k(x) = \dfrac{\sqrt[3]{x-1}}{\sqrt{x^2 + x - 20}}$ $(x+5)(x-4) = 0$

(A) $[-5,4]$ (B) $(-\infty,-4)\cup(5,\infty)$ (C) $(-5,4)$ (D) $[4,\infty)$ (E) $(-5,1]\cup(4,\infty)$

$(-\infty,-5)\cup(4,\infty)$

Part II: Free Response

18 checks Total

Show all work in a logical, vertical sequence and use proper notation. Box your final answers. Work each problem below the given line. Be sure to label individual parts appropriately. <u>No credit will be given for any problems worked above the line.</u>

10. For the following functions $f(x)=-6x^2-x+2$, $g(x)=\sqrt{21-3x}$, $h(x)=2-3x$ $T(x)=x^2-2x-35$ answer the following questions.

(a) Set up the **equation** for the function $k(x)=h(g(x))$, then find the domain.

(b) Sketch the graph of $f(x)$ by factoring the function and finding its x-intercepts. Using the graph, solve the inequality $f(x)<0$.

(c) Set up the **equation** for the function $J(x)=\dfrac{g(x)}{T(x)}$, then find the domain of $J(x)$.

(d) Evaluate and completely simplify $\dfrac{T(x+b)-T(x)}{b}$ for some constant b.

1 C
2 E
3 A
4 E
5 B
6 C
7 C
8 A
9 D

(a) $k(x)=2-3\sqrt{21-3x}$

$21-3x\geq 0$

$-3x\geq -21$

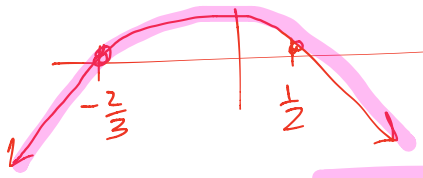
$x\leq 7$

$D_k:\{x\mid x\leq 7\}$

(b) $f(x)=-(6x^2+x-2)=0$

$=-(3x+2)(2x-1)=0$

$x=-\frac{2}{3},\ x=\frac{1}{2}$



$f(x)<0$ for $\{x\mid x<-\frac{2}{3}$ or $x>\frac{1}{2}\}$

(c) $J(x)=\dfrac{\sqrt{21-3x}}{x^2-2x-35}$

$x\leq 7$, $x^2-2x-35\neq 0$

$(x-7)(x+5)\neq 0$

$x\neq 7,\ x\neq -5$

$D_J:\{x\mid x<7, x\neq -5\}$

(d) $\dfrac{T(x+b)-T(x)}{b}$

$\dfrac{[(x+b)^2-2(x+b)-35]-[x^2-2x-35]}{b}$

$\dfrac{x^2+2xb+b^2-2x-2b-35-x^2+2x+35}{b}$

$\dfrac{b(2x+b-2)}{b}$

$2x+b-2$

9 checks