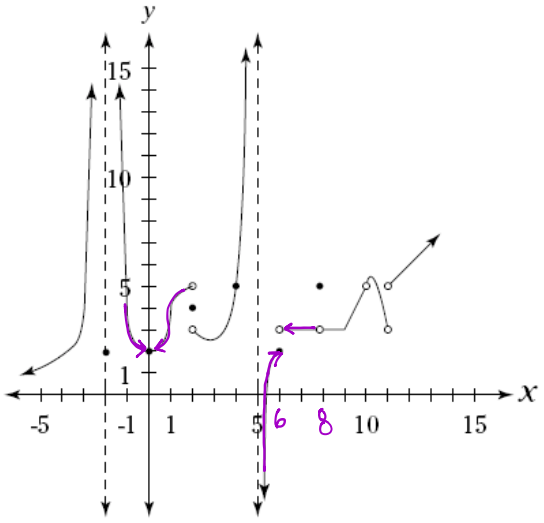
Name KEY Date_____ Period_____

PCPAP TEST: Chapter 1.1-2.2 2016-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

A 2. $\lim_{x\to 0} g(x) =$ (A) 2 (B) 3 (C) 4 (D) 5 (E) DNE

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

C 4. $g(8) =$ (A) 3 (B) 4 (C) 5 (D) 6 (E) DNE

A 5. The function $f(x)=\dfrac{x^2+10x+9}{x^2+6x+5}$ has a removable point discontinuity at

(A) $(-1,2)$ (B) $(-9,0)$ (C) $(-5,2)$ (D) $\left(0,\frac{9}{5}\right)$ (E) $(-1,-2)$

A 6. Simplify: $\dfrac{4x^2y^{-2}+3x^{-2}y^3}{xy^{-1}+2x} = \dfrac{\frac{4x^2}{y^2}+\frac{3y^3}{x^2}}{\frac{x}{y}+\frac{2x}{1}} \cdot \dfrac{x^2y^2}{x^2y^2} = \dfrac{4x^4+3y^5}{x^3y+2x^3y^2}$ (LCM, LCM)

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

D 7. Evaluate $\lim_{x\to\infty} \dfrac{3x^5-2x^7+7}{-3x^6-5x^3+4x^2}$

(A) 0 (B) $\frac{5}{3}$ (C) $-\frac{5}{3}$ (D) ∞ (E) $-\infty$

EBM $y = \frac{-2x^7}{-3x^6} = \frac{2}{3}x$

+ pos slope

_____ 8. Find the domain of $k(x)=\dfrac{\sqrt{x-3}}{\sqrt{x^2-6x-16}}$

(A) $(8,\infty)$ (B) $[3,8)\cup(8,\infty)$ (C) $(-5,4)$ (D) $(-\infty,-2)\cup(8,\infty)$ (E) $[3,\infty)$

$x-3\geq 0$

$x\geq 3$

$x<-2$ $x>8$

$x^2-6x-16>0$

$(x-8)(x+2)>0$

C 9. Which of the following is NOT an equation of an asymptote on the graph of

$$f(x)=\frac{x+4}{x^3+5x^2+6x}$$

(A) $y=0$ (B) $x=-2$ (C) $x=-4$ (D) $x=0$ (E) $x=-3$

Part II: Free Response

Show all work in a logical, vertical sequence and use proper notation. Your bottom line in each problem will be your answer. Work each problem in the space provided.

10. For the following functions, $f(x)=5+2\sqrt{12+4x}$, $g(x)=\sqrt{x-11}$, $h(x)=x^2+6x-16$ answer the following questions.

(a) Set up and simplify the **equation** for the function $P(x)=g(h(x))$, and then find the domain. Show the work that leads to your answer. Give your domain in either proper set or interval notation.

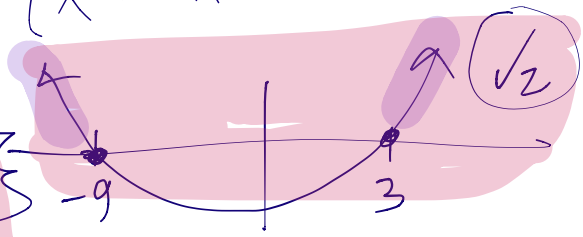
$P(x)=\sqrt{(x^2+6x-16)-11}$ ✓1

$=\sqrt{x^2+6x-16-11}$ or

$P(x)=\sqrt{x^2+6x-27}$ OR

$x^2+6x-27\geq 0$

$(x+9)(x-3)\geq 0$



✓2

$x\leq -9$ or $x\geq 3$

$D_P:\{x\mid x\leq -9 \text{ or } x\geq 3\}$

or

$D_P:(-\infty,-9]\cup[3,\infty)$ ✓3

(b) Set up the **equation** for the function $R(x)=\dfrac{2x-8}{g(x)}$, and then find the domain of $R(x)$. Show the work that leads to your answer. Give your domain in either proper set or interval notation.

$R(x)=\dfrac{2x-8}{\sqrt{x-11}}$ ✓4

Rad: $x-11\geq 0$, $x\geq 11$

Denom: $\sqrt{x-11}\neq 0$, $x\neq 11$

$D_R:\{x\mid x>11\}$

or

$D_R:(11,\infty)$ ✓5

(c) Set up the **equation** for the function $J(x)=\dfrac{f(x)}{h(x)}$, and then find the domain of $J(x)$. Show the work that leads to your answer. Give your domain in either proper set or interval notation.

$J(x)=\dfrac{5+2\sqrt{12+4x}}{x^2+6x-16}$ (√6)

Rad

$12+4x\geq 0$

$4x\geq -12$

$x\geq -3$

Denom

$x^2+6x-16\neq 0$

$(x+8)(x-2)\neq 0$

$x\neq -8, x\neq 2$

$D_J: \{x \mid x\geq -3, x\neq 2\}$ or $D_J: [-3,2)\cup(2,\infty)$ (√4)

(d) Set up and **completely simplify** $\dfrac{h(x+p)-h(x)}{p}$ for some constant p. Show the work that leads to your answer.

$h(x)=x^2+6x-16$

$\dfrac{[(x+p)^2+6(x+p)-16]-[x^2+6x-16]}{p}$ (√8)

$\dfrac{x^2+2xp+p^2+6x+6p-16-x^2-6x+16}{p}$

$\dfrac{p(2x+p+6)}{p}$

$2x+p+6$ (√9)