A.M.D.G.

PRECALCULUS ACCELERATED
Spring Practice Midterm – **CALCULATOR ALLOWED**

NAME: _____
Date: _____ Period: _____

Directions: Complete each of the following NEATLY IN PENCIL in the space provided. Show all work; round at **THREE** decimal places. Good luck!

Multiple Choice (3 pts. each)

1. The slope of the line tangent to the graph of $f(x) = -x^2 + 4\sqrt{x}$ at the point where $x = 4$ is

(a) -8
(b) -10
(c) -9
(d) -5
(e) -7

2. Suppose you can take out a 30-year loan for a \$550,000 house, at a fixed APR of 5.25% compounded monthly. What are your monthly payments?

$$S = P\left(1 + \frac{r}{n}\right)^{nt}, \quad S = P\frac{\left(1+\frac{r}{n}\right)^{nt} - 1}{\frac{r}{n}}, \quad A = P\frac{1-\left(1+\frac{r}{n}\right)^{-nt}}{\frac{r}{n}}$$

(a) \$114,245.95
(b) \$630.87
(c) \$3037.12
(d) \$181.09
(e) \$871.81

3. If $\log_4 x + 3\log_4 x = 9$, then $x =$

(a) 1.86
(b) 2.25
(c) 9
(d) 22.6
(e) 256

4. Given $y = x^2 \ln x$

a. $y' = 2$ b. $y' = 2x \cdot \frac{1}{x}$ c. $y' = 2x\ln x - x$ d. $y' = 2x\ln x + x$ e. $y' = \frac{2x}{\ln x}$

5. Given $y=(x-x^2)e^{-x}$

a. $y'=(1-x-x^2)e^{-x}$ b. $y'=(x^2-3x+1)e^{-x}$ c. $y'=(1-2x)(-xe^{-x-1})$ d. $y'=\dfrac{1-2x}{e^{-x}}$ e. $y'=-\dfrac{1-2x}{e^{-x}}$

Free Response

1. Find the domain, zeros, extreme points, and intervals of decreasing for $y=\sqrt{-2x^3+7x^2+50x-175}$

Domain:

Zeros:

VA's:

Extreme Points:

Intervals of Decreasing:

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PRECALCULUS ACCELERATED
Spring Practice Midterm – **NO CALCULATOR ALLOWED**

NAME: _____
Date: _____ Period: _____

Directions: Complete each of the following NEATLY IN PENCIL in the space provided. Show all work; round at **THREE** decimal places. Good luck!

Multiple Choice (3 pts. each)

4. The table at right gives the values of the differentiable functions *f* and *g* and their derivatives at $x=1$. If $h(x)=(2f(x)+3)(1+g(x))$, then $h'(1)=$

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	3	–2	–3	4

(a) –28
(b) –16
(c) 40
(d) 44
(e) 47

6. Which of the following is true about the function *f* if $f(x)=\sqrt{\dfrac{x^2+x-2}{2x^2+x-3}}$?

I. *f* has a zero at $x=1$.
II. The graph of *f* has a POE at $x=1$.
III. The graph of *f* has a horizontal asymptote at $y=\dfrac{1}{2}$.

(a) II only
(b) I and II only
(c) I and III only
(d) II and III only
(e) I, II and III

Free Response (10 pts. each)

4. List all traits and sketch $y = \sqrt{\dfrac{2x-3}{x^2+4}}$

Domain:

Zeros:

y-int:

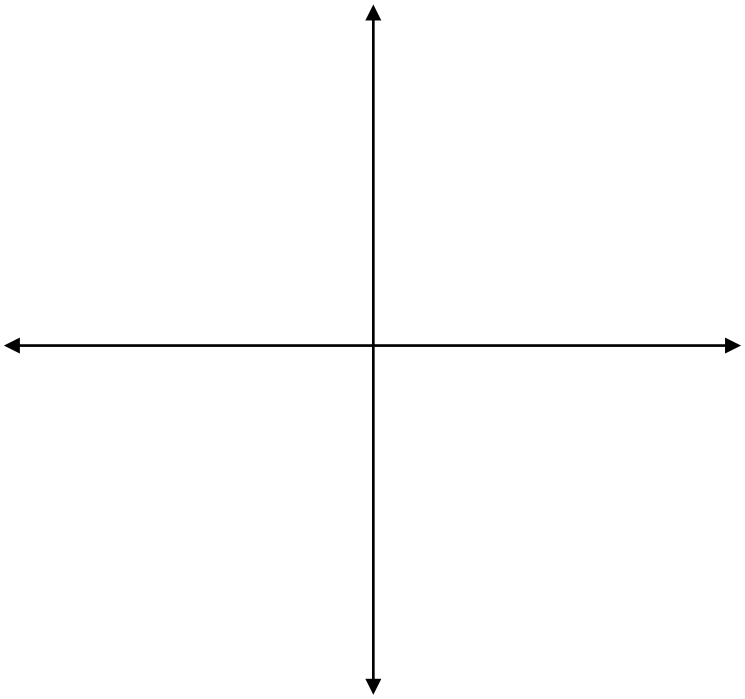
VAs:

EB:

POEs:

Extreme Points:

Range:



5. List all traits **and** sketch $y = \ln x$.

Domain:

Zeros:

y-int:

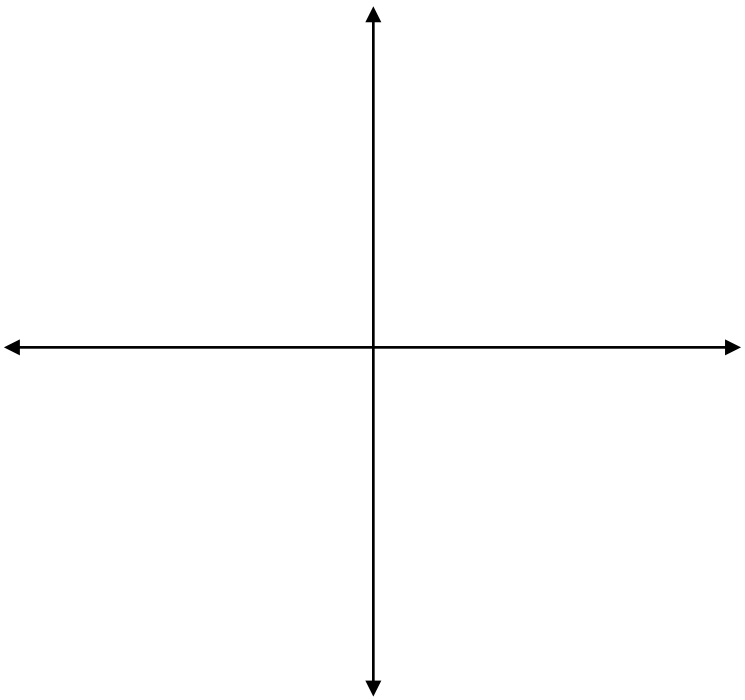
VAs:

EB:

POEs:

Extreme Points:

Range:



6. List all traits **and** sketch $y = a^x$.

Domain:

Zeros:

y-int:

VAs:

EB:

POEs:

Extreme Points:

Range: