

Name: _____

Student ID: _____

Instructor: _____

Class Hour: _____

INSTRUCTIONS:

- (1) **There is no credit for guessing. You must show your work to receive credit!**
- (2) Please fill in all the above information and write your name on the top of each of the 4 exam pages.
- (3) The point value on each problem appears to the left of the problem.
- (4) You must show sufficient work to justify all answers. Correct answers with inconsistent work may not be given credit.
- (5) No partial credit will be given on problems 1-3. Partial credit may be obtained on problems 4-10 provided sufficient work is shown.
- (6) Write your answers to the problems in the spaces provided.
- (7) No books or paper are allowed. Calculators may be used where appropriate.
- (8) The exam is self-explanatory. **Please do not ask the instructor to interpret any of the exam questions.**
- (9) On Monday, November 20, the solutions to the exam will be linked to the course web page. Click on Exam 3 at: www.math.purdue.edu/~delworth/ma153/ma153page.html

Page	Points	Max Possible
1		24
2		30
3		24
4		22
Total		100

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Place your answers in the spaces provided. You must show work to receive credit.**There is no partial credit on this page.**

- (8 pts.) 1. For $f(x) = x^2 - 3$, find $\frac{f(x+h) - f(x)}{h}$. Simplify your answer completely

$$\frac{f(x+h) - f(x)}{h} =$$

- (8 pts.) 2. Given: $g(x) = 6x$ and $f(x) = 2x^2 - 4$, find $(f \circ g)(3)$

$$(f \circ g)(3) =$$

- (8 pts.) 3. Find the remainder if $f(x)$ is divided by $p(x)$.
If you use the remainder theorem you will save a lot of time.

$$f(x) = 5x^8 - 2x^5 + 3x^2 - 4, \quad p(x) = x + 1$$

Remainder =

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Place your answers in the spaces provided. You must show work to receive credit.

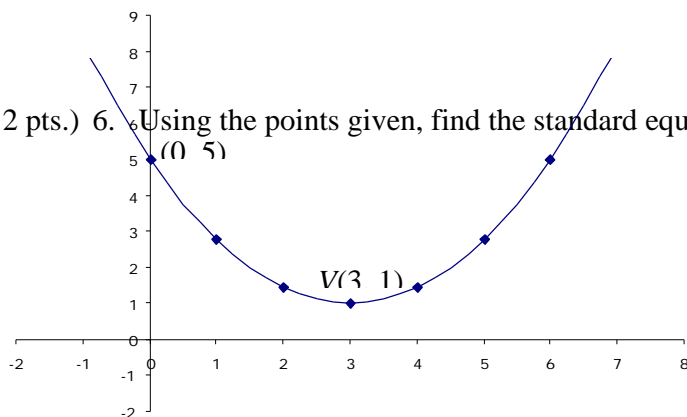
- (8 pts.) 4. y varies directly as the square root of x and inversely as the cube of z .
If $y = 1$ when $x = 4$ and $z = 2$, find y when $x = 9$ and $z = 3$.

$y =$

- (10 pts.) 5. Given $y = f(x)$, with domain $[-5, 10]$ and the range $[-12, -3]$.
Find the domain and range of $y = -f(x + 3)$.

Domain =
Range =

- (12 pts.) 6. Using the points given, find the standard equation, $y = a(x - h)^2 + k$, of the parabola.



$y =$

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Place your answers in the spaces provided. You must show work to receive credit.

- (12 pts.) 7. Algebraically, find all points of intersection (if any) of the following equations.
Do not solve graphically or with matrices.

$$xy = 4$$

$$-16x + y = -12$$

Point(s):

- (12 pts.) 8. A painting is worth \$500 in 1982 and appreciates to \$1025 by 1992.
Assuming a linear growth, express the painting's value, V , in terms of time t ,
in years, where $t = 0$ corresponds to the year **1980**.

 $V(t) =$

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Place your answers in the spaces provided. You must show work to receive credit.

- (10 pts.) 9. Find all values of x , in interval notation, such that $f(x) > 0$ and all x such that $f(x) < 0$.
 $f(x) = (x - 3)^2(x + 2)$

All x such that $f(x) > 0$

All x such that $f(x) < 0$

- (12 pts.) 10. A woman rows a boat 368 feet downstream, with the current, in 8 minutes. She then rows 585 feet upstream, against the same current, in 15 minutes. Find the speed of the current and the rate at which she can row in still water. Name the variables, set up equations and solve.

Speed of the current –

Her rate in still water –
