

Math 150

NEATLY PRINT NAME: _____

Exam 2

STUDENT ID: _____

Fall 2010

DATE: _____

SECTION: Circle your correct section number.

Tuesday recitations: 501 503 505 507 509 511 525 527 529

Thursday recitations: 502 504 506 508 510 512 526 528 530

TEST NO.: **PUMPKIN**

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

Signature of student

Academic Integrity Task Force, 2004
<http://www.tamu.edu/aggiehonor/FinalTaskForceReport.pdf>

My signature in this blank allows my instructor to pass back my graded exam in class or allows me to pick up my graded exam in class on the day the exams are returned. If I do not sign the blank or if I am absent from class on the day the exams are returned, I know I must show my Texas A&M student ID during my instructor's office hours to pick up my exam.

Signature of student _____

NO CALCULATORS ALLOWED!

This is a 10-question multiple-choice exam; there is no partial credit. Each problem is worth 5 points for a total of 50 points. There will be a 5-point bonus if you have no transgressions. Transgressions include not having the correct Scantron form 882E, not filling out your Scantron form correctly, having a folded or mutilated Scantron, having your cell phone ring or vibrate, not having your TAMU student ID, not following directions, not turning in your exam and Scantron on time (you must be finished filling in your Scantron and exam cover before time is called). *The Scantron will not be returned so also mark all your answers on this test paper.*

SCANTRON: Please double check to make sure you have completed your Scantron correctly, as shown below.

Name: print your name neatly

Subject: Math 150

Date: October 2010

Test No.: **PUMPKIN**

Period: your section number

1. Find the standard equation of the parabola that goes through the point $(2,4)$ and whose vertex is the midpoint of the line segment whose endpoints are $(3,-5)$ and $(-9,-7)$.

a. $f(x) = \frac{3}{16}(x-6)^2 + 1$

b. None of these

c. $f(x) = \frac{5}{64}(x+6)^2 - 1$

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

e. $f(x) = 2(x+3)^2 - 6$

2. Find the value of x such that the point $P(x,-5)$ is equidistant from the points $A(2,4)$ and $B(-6,1)$; that is, $d(P,A) = d(P,B)$.

a. $x = \frac{13}{16}$

b. $x = \frac{5}{16}$

c. $x = \frac{47}{16}$

d. $x = \frac{-77}{16}$

e. None of these

3. Describe the end behavior of the polynomial $p(x) = \frac{-5}{3}x^5 + 6x^2 + \frac{7}{4}x^9 - 7x + 12$.

a. None of these

b. As $x \rightarrow -\infty$, $p(x) \rightarrow \infty$ and as $x \rightarrow \infty$, $p(x) \rightarrow \infty$.

c. As $x \rightarrow -\infty$, $p(x) \rightarrow -\infty$ and as $x \rightarrow \infty$, $p(x) \rightarrow \infty$.

d. As $x \rightarrow -\infty$, $p(x) \rightarrow -\infty$ and as $x \rightarrow \infty$, $p(x) \rightarrow -\infty$.

e. As $x \rightarrow -\infty$, $p(x) \rightarrow \infty$ and as $x \rightarrow \infty$, $p(x) \rightarrow -\infty$.

4. If $f(x) = (x+4)^3 - 7$, find its inverse function. The domain and range of f and f^{-1} are all real numbers.

a. $f^{-1}(x) = (x+7)^{\frac{1}{3}} - 4$

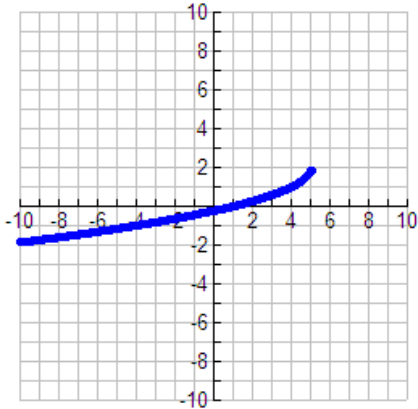
b. $f^{-1}(x) = x+4 - 7^{\frac{1}{3}}$

c. $f^{-1}(x) = (x-4)^{\frac{1}{3}} + 7$

d. $f^{-1}(x) = \frac{1}{(x+4)^3 - 7}$

e. None of these

5. What is the equation of the given graph?



- a. $y = -\sqrt{-(x-5)} + 2$
- b. $y = \sqrt{-(x-5)} + 2$
- c. None of these
- d. $y = -\sqrt{-(x^2-5)} - 2$
- e. $y = -\sqrt{x-5} - 2$

6. Evaluate $f(-2) + f(3)$, if $f(x) = \begin{cases} x^3 & \text{if } x \leq -2 \\ |x| & \text{if } -2 < x \leq 1 \\ x^{-1} & \text{if } x > 1 \end{cases}$.

- a. -5
- b. $\frac{7}{3}$
- c. $\frac{5}{2}$
- d. $\frac{-23}{3}$
- e. 29

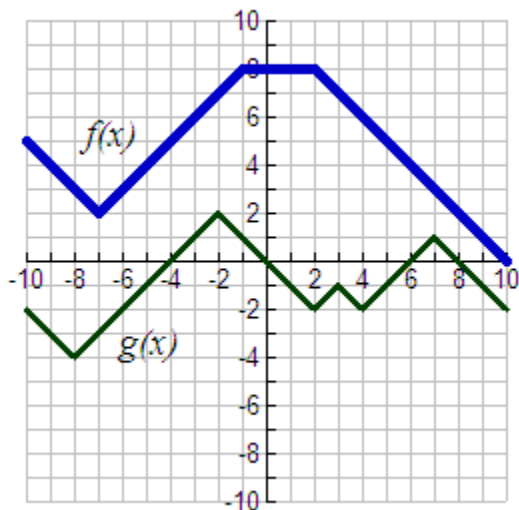
7. What is the domain of the function $f(x) = \frac{\sqrt[6]{8-x}}{\sqrt{x^2-15x+56}}$?

- a. $(-\infty, 7]$
- b. None of these
- c. $(-\infty, 7) \cup (8, \infty)$
- d. $(-\infty, 7) \cup [8, \infty)$
- e. $(-\infty, 7)$

8. It takes Chris 1 hour and 20 minutes longer to clean the industrial kitchen than it does Jose. If they work together it takes 6 hours to complete the cleaning. What is the correct set up of the problem to find x , the number of hours it would take Chris to clean the kitchen by himself?

- a. $\frac{1}{x} + \frac{3}{3x+4} = \frac{1}{6}$
 b. $x + x - \frac{4}{3} = 6$
 c. $\frac{1}{x} + \frac{3}{3x-4} = 6$
 d. None of these
 e. $\frac{1}{x} + \frac{3}{3x-4} = \frac{1}{6}$

USE THIS GRAPH FOR THE NEXT TWO PROBLEMS:



9. Use the graph of $f(x)$ to evaluate $h(3)$ if $h(x) = -3f(x+5) - 11$.

- a. -11
 b. -47
 c. None of these
 d. -9
 e. -5

10. Evaluate $\left(\frac{f+g}{g}\right)(2)$ and $(g \circ f)(-3)$, respectively.

- a. 8, 0
 b. None of these
 c. -3, 0
 d. 8, 8
 e. -3, 8

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STUDENT ID: _____

Fall 2010

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SECTION: Circle your correct section number.

Tuesday recitations: 501 503 505 507 509 511 525 527 529

Thursday recitations: 502 504 506 508 510 512 526 528 530

TEST NO.: **HARVEST**

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

Signature of student

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Signature of student _____

NO CALCULATORS ALLOWED!

This is a 10-question work-out exam. Each problem is worth 5 points for a total of 50 points. Write all solutions in the space provided as full credit will not be given without complete, correct accompanying work, even if the final answer is correct. Fully simplify all your answers, and give exact answers unless otherwise stated. Justify your answers algebraically whenever possible. Circle your final answer. Remember your units!

One cannot escape the feeling that mathematical formulas have an independent existence and intelligence of their own, that they are wiser than we are. Heinrich Hertz

1. Find the *exact* center of the circle $2x^2 - 2x + 2y^2 + 8y + 5 = 0$.

Center: _____

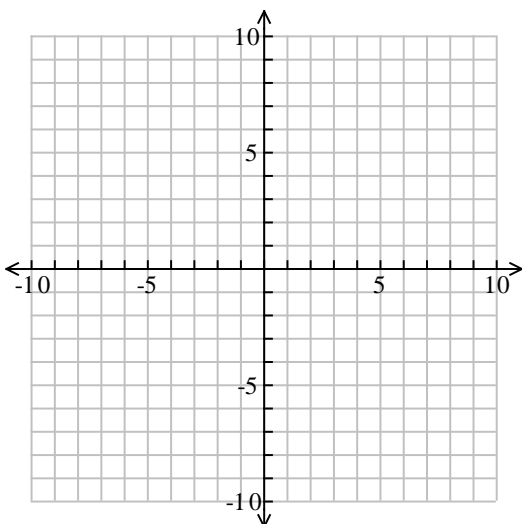
5-point Bonus: What is the *exact* domain, in interval notation, of this circle? _____

2. Algebraically test $y^2 - 3x^2y = 6x^4 + 2$ for y -axis symmetry.

Its graph (circle one) **IS** or **IS NOT** symmetric with respect to the y -axis.

3. Sketch any function that satisfies *all* of the following: is an *odd* function; has $(-\infty, \infty)$ as its domain; is increasing on the interval $(2, 6)$; is decreasing on the intervals $(0, 2)$ and $(6, \infty)$; has x -intercepts at 0, 4 and 10; has a y -intercept of 0; has a local minimum value of -2 ; and has a local maximum value of 2.

You are not being graded on your artistic skills here; just draw a function that meets *all* of the requirements given.



4. Find the slope-intercept form of the line that passes through the point $(-4, -3)$ and that is perpendicular to the line $y = \frac{1}{2}x + 9$.

$y =$ _____

5. If $f(x) = 6x^2 - 4$, evaluate and simplify the difference quotient. Remember to first give the general formula for the difference quotient.

6. Find functions f and g such that $h(x) = (f \circ g)(x)$ where $h(x) = \frac{\sqrt{x-5}}{(x-5)^2 + 8}$ such that neither f nor g is equal to just x .

$f(x) =$ _____

$g(x) =$ _____

7. A maroon marble is thrown straight upwards on the planet Aggie and will reach a height $h(t) = -12t^2 + 24t$ meters after t seconds. After *exactly* how many seconds will the marble reach a height of 8 meters? Give all feasible answers.

_____ seconds

8. Olivia wants to make 100 ml of a 24% balsamic vinegar solution by mixing a 12% balsamic vinegar solution and a 52% balsamic vinegar solution. How much of the 12% balsamic vinegar solution should be used? Remember to define your variables and remember the units in your answer.

_____ of 12% balsamic vinegar solution

9. Given $f(x) = -4x^2 + 6x - 2$.

- a. (2pts) Algebraically find the vertex.

Vertex: _____

- b. (1 pt) Compared to $g(x) = x^2$, f has been vertically stretched by a factor of _____

- c. (2 pts) What are the zeros of f ?

$x =$ _____

10. Given $f(x) = \frac{-6x}{x^2}$ and $g(x) = \sqrt{1-x}$.

- a. (3 pts) Evaluate and simplify $(f \circ g)(x)$.

- b. (1 pt) What is the domain of $f \circ g$ in interval notation?

- c. (1 pt) Is f a one-to-one function? Circle one: **YES** **NO**