

(c) Scarborough, September 2010, Math 150, Exam I

Math 150

NEATLY PRINT NAME: \_\_\_\_\_

Exam 1

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.: *PEONIES*

"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:** September 2010

**Test No.:** *PEONIES*

**Period:** your section number

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1. Fully simplify  $\frac{x^{-2}y^{\frac{1}{2}}z^{-3}}{\left(\frac{2xz^{-5}}{y}\right)^3}$ . Assume all variables are positive.

a.  $\frac{z^{12}}{2x^6y^{\frac{5}{2}}}$

b. None of these

c.  $\frac{y^{\frac{7}{2}}z^{12}}{2x^5}$

d.  $\frac{y^{\frac{7}{2}}}{8x^5z}$

e.  $\frac{y^{\frac{7}{2}}z^{12}}{8x^5}$

2. Fully simplify  $|3-4i|(\overline{2i-1})(5i+1)$ .

a.  $-17\sqrt{5}+19\sqrt{5}i$

b.  $-1-57i$

c.  $45-35i$

d. None of these

e.  $-45+35i$

3. Exactly solve  $a^3c+1=9c-\frac{2a}{3}$  for  $c$ .

a.  $c=\frac{3+2a}{a^3-9}$

b.  $c=\frac{-3-2a}{3(9-a^3)}$

c.  $c=a^3+\frac{2}{3}a-8$

d.  $c=\frac{-3-2a}{a^3-9}$

e.  $c=\frac{3+2a}{3(9-a^3)}$

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4. Fully simplify  $-2^4 + 64 \div 4 \cdot 2 - 3^0 |4 - |5 - 6||$ .

- a. 16
- b. 13
- c. -11
- d. 45
- e. None of these

5. If  $a$  and  $b$  are *positive*, complete the sign chart to find the solution to  $\frac{x-a}{x+b} \geq 0$ . Give the answer in interval notation.



$x-a$	-	-	+
$x+b$	-	+	+

---

$\frac{x-a}{x+b}$

- a.  $(-\infty, -b) \cup [a, \infty)$
- b.  $(-b, a]$
- c.  $(-\infty, -b] \cup [a, \infty)$
- d.  $[-b, a]$
- e.  $(-\infty, b) \cup [a, \infty)$

6. Rationalize the denominator and fully simplify  $\frac{\sqrt{y^2}}{\sqrt[5]{(3x-5)^4}}$ .

- a. None of these
- b.  $\frac{y\sqrt[5]{3x-5}}{3x-5}$
- c.  $\frac{y\sqrt{3x-5}}{3x-5}$
- d.  $\frac{|y|\sqrt[5]{3x-5}}{3x-5}$
- e.  $\frac{|y|\sqrt{3x-5}}{3x-5}$

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7. Perform polynomial long division on  $\frac{4x^3 - 2x^2 + 4}{2x^2 - 5}$ . Identify the remainder.

- a.  $20x + 4$
- b. 24
- c. None of these
- d.  $10x - 1$
- e.  $-10x + 9$

8. Solve  $-2 \leq 6 - x < 9$  for  $x$ . Give the answer in interval notation.

- a.  $(-3, \infty]$
- b.  $[-8, 3)$
- c. No solution
- d.  $(-\infty, -3) \cup [8, \infty)$
- e. None of these

9. Fully simplify  $\frac{3(x-2)^{\frac{1}{3}} - 3x\left(\frac{1}{3}\right)(x-2)^{-\frac{2}{3}}}{\left((x-2)^{\frac{1}{3}}\right)^2}$ .

- a.  $\frac{-2}{(x-2)^{\frac{4}{3}}}$
- b.  $\frac{2(x-1)}{x-2}$
- c.  $\frac{2(x-1)}{(x-2)^{\frac{4}{3}}}$
- d. None of these
- e.  $\frac{2(x-3)}{(x-2)^{\frac{4}{3}}}$

10. Exactly solve  $7 + \sqrt{x-1} = x$  for  $x$ . If there is exactly one solution, what is it? If there is more than one solution, find the **SUM** of all the solutions.

- a. 10
- b. 5
- c. No solution
- d. 15
- e. -15

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

TEST NO.: *PINE*

"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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**You must clear your calculator BEFORE and AFTER the exam.**

**MEM (2<sup>nd</sup> +), Reset, ALL, Reset**

**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!**

*What is provable should not be believed in science without proof.*

J. W. R. Dedekind

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1. Simplify  $\frac{6x^4 - 24x^2}{-12x^3 - 36x^2 + 120x}$  completely. Then state *all* restrictions on the variable.

$x \neq$  \_\_\_\_\_

2. Rationalize the denominator and fully simplify  $\frac{3}{4 - 3\sqrt{5}}$ .

3. Completely factor  $3x^3 + 18x^2 - 75x - 450$ .

4. Fully simplify  $\sqrt[10]{8^{10} x^{20} y^{10} z^{13}}$ . Do *not* use fractional exponents in your answer.

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5. Exactly solve  $3 - |x + 5| \leq -9$  for  $x$ . Give the answer in interval notation.

6. Fully simplify  $(6 - \sqrt{-25})(2i^3 - 1)$  and then write the answer in standard form.

7. Exactly solve  $x^{\frac{4}{5}} = 13x^{\frac{2}{5}} - 36$  for  $x$ .

$x =$  \_\_\_\_\_

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8. Fully simplify  $\frac{2 + \frac{1}{x}}{\frac{4x+2}{x-1}}$ .

For 5-points extra credit, state **all** restrictions on the variable:  $x \neq$  \_\_\_\_\_

9. Write  $\frac{(-2x^a x^{-c})^2}{\frac{x^{ac}}{3x^n}}$  as a multiple of a single power of  $x$ .

10. Exactly solve  $x^3 < 4x^2 + 12x$  for  $x$ . Give the answer in interval notation.