

Math 108 Exam #1

September 28, 2016

Time: 1 hour and 25 minutes

Instructions: Show all work for full credit.
No outside materials or calculators allowed.

Extra Space: Use the backs of each sheet for extra space. Clearly label when doing so.

Name: _____

ID #: _____

Instructor/Section: _____

*"I pledge by my honor that I have abided by the
NJIT Academic Integrity Code."*

_____ (Signature)

Problem(s) Score Total

Problem(s)	Score	Total

1. Evaluate the following (16 points):

a. $\frac{x}{3} - \frac{3x}{4} = 2$

b. $4b + 2 - 5b = 7 - 6b$

c. $\frac{5}{4}x + \frac{1}{2} = x - \frac{1}{2}$

d. $x - 3(2x + 3) = 8 - 5x$

2. Factor completely. If the expression is not factorable state not factorable: **(12 points)**

a) $3x^3 + 2x^2 - 12x - 8$

b) $x^2 + 5x - 50$

c) $8x^2 - 17x - 21$

d) $16x^4 - 64$

3. Rationalize the denominator: **(8 points)**

a) $\frac{\sqrt{t} + 5}{\sqrt{t} - 5}$

a) _____

b) $\frac{-3}{\sqrt{5}}$

b) _____

4. Simplify each radical expression the, if possible complete the operation indicated.
(10 Points)

a) $\sqrt{200} + \sqrt{32}$

b. $\sqrt[3]{16x} - \sqrt[3]{54x^4}$

5. Evaluate: **(4 points)**

$$\frac{6.0 \times 10^8}{3.0 \times 10^{-3}}$$

5) _____

6. Perform the indicated operation and simplify: **(6 points)**

a) $\sqrt[3]{16x^3y^8z^4}$

a) _____

b) $\sqrt[4]{512}$

b) _____

c) $\sqrt[3]{320}$

c) _____

7. (10 points)

An investment firm has \$100,000 to invest in a for a client and decides to invest it in two stocks, A and B. The expected annual rate of return, or simple interest, for stock A is 15%, but there is some risk involved, and the client does not wish to invest more than \$50,000 in this stock. The annual rate of return on the more stable stock B is anticipated to be 10%. Determine whether there is a way of investing the money in one year so the annual interest is

a) \$12,000

b) \$13,000 (Hint: $I = Prt$)

8. Factor the following using a special formula: (10 points)

a) $8x^3 + 27$

a) _____

b) $9x^2 - 16y^2$

b) _____

9. Find the product: $(4x+1)(16x^2-4x+1)$ (4 points)

9. _____

10. Simplify: (10 points)

a) $-3\sqrt{18} + 3\sqrt{8} - \sqrt{24}$

a) _____

b) $-\sqrt{45} + 2\sqrt{5} - \sqrt{20} - 2\sqrt{6}$

b) _____

11. Evaluate: **(4 points)**

a) -13^2

a) _____

b) $\left(\frac{7}{8}\right)^{-2}$

b) _____

12. **(6 points)**

a) Simplify the expression: $6y^2(2y^4)^0$

b) Evaluate the expression for an exact solution: $-25^{\frac{1}{2}}$

c) Simplify fully, using positive exponents: $\left(\frac{a^{\frac{2}{3}}b^{\frac{3}{2}}}{a^2b}\right)^6$