

Extra Credit for Exam 2

Due Friday, November 30, 11:35 a.m. No late assignments will be accepted. Assignments must be handed in during class, at my office (LCB Loft), my mailbox (in JWB 228), or emailed to me.

Directions: Show all work for full credit. Simplify all answers completely. Clearly indicate all answers. You are allowed to use the textbook, your class notes, homework problems, quizzes, and exams as references. However, the use of calculators is not permitted.

Work independently. Do not use classmates, the tutoring center, family members, friends, or other people as references. Use of the internet is not allowed.

This assignment is worth a maximum of 15 points. The points you earn will be added to your score from Exam 2.

If you choose to do this assignment, you must do all questions in the Algebra section. Note that these questions are not for credit. However, in order to receive full credit on the Trigonometry section, you must receive at least an 80% on the Algebra section. If you receive lower than an 80% on the Algebra portion, your score on the Trigonometry section will be pro-rated based on the percentage you got on the Algebra section (out of 80%). For example, if you receive an 85% on the Algebra section and 10 points on the Trigonometry section, 10 points will be added to your Exam 2 score. If you receive a 70% on the Algebra section and 10 points on the Trigonometry section, $10 \cdot \frac{70}{80} = 8.75$ points will be added to your Exam 2 score.

Do the problems in order on a separate sheet of paper. Be sure to staple multiple page assignments.

1 Algebra

1. Simplify each of the following expressions:

(a) $\frac{5}{\sqrt{50}}$

(b) $10^2 + (5\sqrt{2})^2 - 2 \cdot 10 \cdot (5\sqrt{2}) \cdot \frac{\sqrt{2} - \sqrt{6}}{4}$

2. Solve each of the following equations for x . Give all solutions.

(a) $\frac{20}{1/2} = \frac{x}{\frac{\sqrt{2} + \sqrt{6}}{4}}$

(b) $3x^2 - 4 = 0$

(c) $x(x + 1) = 0$

(d) $5 = \frac{x}{2}$

3. Let x , y , and z be real numbers. Determine whether each of the following statements hold. If a statement holds, show why. If it does not hold, give an example to disprove it.

(a) If $x \neq 0$ and $z \neq 0$, $\frac{x+y}{x+z} = \frac{y}{z}$.

(b) If $x \neq 0$ and $z \neq 0$, $\frac{x^2+y}{x+z} = \frac{x+y}{z}$.

(c) If $x \geq 0$ and $y \geq 0$, $\sqrt{x+y} = \sqrt{x} + \sqrt{y}$.

(d) If $x - y \neq 0$, $\frac{x^2 - y^2}{x - y} = x - y$.

(e) $z(xy) = (zx)(zy)$.

(f) If $y \neq 0$ and $z \neq 0$, $\frac{\left(\frac{x}{y}\right)}{z} = \frac{x}{\left(\frac{y}{z}\right)}$.

2 Trigonometry

1. Simplify the following expression: (3 points)

$$\frac{1 + \cos \phi}{\sin \phi} + \frac{\sin \phi}{1 + \cos \phi}$$

2. Give all solutions to the following equation: (3 points)

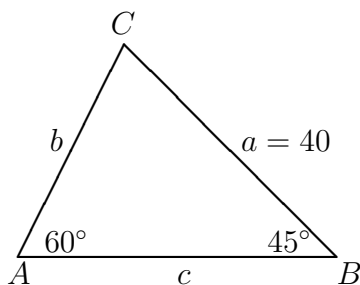
$$\sin 3x(3 \tan^2 x - 1) = 0$$

3. Evaluate each of the following expressions: (2 points each)

(a) $\cos \frac{9\pi}{8}$

(b) $\sin 195^\circ$

4. Find the exact length of side c in the following triangle: (3 points)



5. Find a unit vector in the direction of the vector $\langle -1, 4 \rangle$. (2 points)