MATH 123 **Order of Operations**

Determine the value of the given expression, simplifying completely. Carefully consider the operations that you perform in evaluating the expression. Remember that obtaining a "correct answer" is more than getting the correct numerical value for the expression. A correct answer includes the notation, and the way in which you communicate your work. You will benefit from this exercise more if you do NOT use your calculator.

1. $\frac{5}{12}\left(-\frac{8}{15}\right)\left(-\frac{1}{3}\right)$ **2.** $\left(-\frac{33}{8}\right)\left(-\frac{28}{210}\right)$ **3.** $\left(\frac{5}{12}-\frac{9}{16}\right)\frac{3}{7}$ **4.** $\left(\frac{7}{15}-\frac{11}{20}\right)\frac{3}{7}$

5. In working problems similar to Problems 1 – 4, what should one consider when evaluating expressions containing fractions? What observations can you make while working Problems 1 and 2? What observations did you make while working Problems 3 and 4?

6. $24 \div \frac{3^2}{8-5} - (-5)$

7. $16 - 4 \cdot \frac{3^3 - 7}{2^3 + 2} - (-2)^2$

8. Given the expression
$5 - 8 \cdot \frac{4+6^2}{4^2-6} \div (-4)^2 + 20$,
(a) can we reduce the 4 and the 6 in the fraction? Explain why or why not.
(b) Evaluate the expression.

9. Is the expression
$5 - 8 \cdot \frac{4+6^2}{4^2-6} \div \left((-4)^2 + 20\right)$ the same as the expression given in Problem 8? Explain why or why not. Evaluate the expression.

10. $25 - 8 \div \frac{6^2+4}{4^2-6} - (-4)^2$

11. Is the expression $25 - 8 \div \frac{6^2+4}{4^2-6} - -4^2$ the same as the expression in Problem 10? Explain why or why not. Evaluate the expression.

12. $25 - 8 \div \frac{-6^2-4}{4^2-6} - (-4)^2$

13. Is the expression $25 - 8 \div \frac{-6^2-4}{-4^2+6} - -4^2$ the same as the expression in Problem 12? Explain why or why not. Evaluate the expression.

14. Given the expression
$25 - 8 \div \frac{(-6)^2 - (-4)}{(-4)^2 + (-6)} - -4^2$,
(a) can we reduce the –4 and the –6 in the fraction? Explain why or why not.
(b) Evaluate the expression.

15. Is the expression
$25 - 8 \div \frac{(-6)^2 - (-4)}{(-4)^2 + (-6)} - (-4)^2$ the same as the expression given in Problem 14? Explain why or why not. Evaluate the expression

16. In evaluating any expression, what do you use to determine how to evaluate and to simplify the expression? Of what must you be careful?