

MATH 102
 SPRING 2012
 EXAM 5

NAME:

1. Consider the set of constraints

$$\begin{cases} 2x + 3y \geq 18 \\ 4x + 2y \leq 20 \\ x \geq 1 \\ y \geq 4 \end{cases}$$

and the objective function $P = 2.20x + 1.65y$.

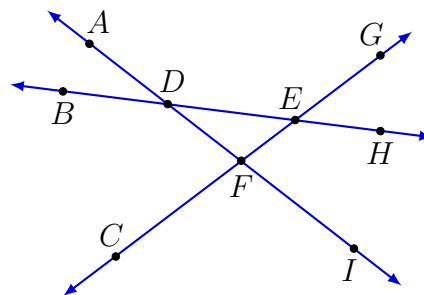
- (a) 10 pts. Graph the set of constraints and find the vertices of the feasible region.
- (b) 10 pts. Determine the maximum and minimum value of P , subject to the constraints.

2. A farmer has 10 acres to plant in wheat and rye. He has to plant at least 7 acres. However, he has only \$1200 to spend and each acre of wheat costs \$200 to plant and each acre of rye costs \$100 to plant. Moreover, the farmer has to get the planting done in 12 hours and it takes an hour to plant an acre of wheat and 2 hours to plant an acre of rye. The profit is \$500 per acre of wheat and \$300 per acre of rye. The goal is to maximize profit.

- (a) 10 pts. List the constraints.
- (b) 5 pts. Determine the objective function.
- (c) 10 pts. Graph the set of constraints and find the vertices of the feasible region.
- (d) 5 pts. How many acres of each type of grain should be planted to maximize profit? What is the maximum profit?

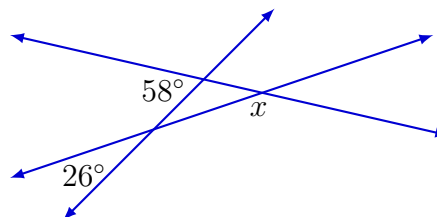
3. 10 pts. The difference between the measures of two supplementary angles is 88° . Find the measures of the two angles.

4. 5 pts. each Use the figure to find the following:

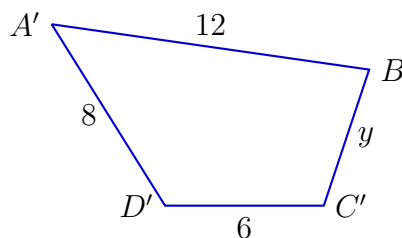
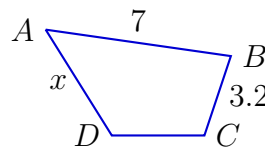


- (a) $\overrightarrow{EH} \cup \overrightarrow{EB}$
- (b) $\angle GFI \cap \angle BEC$
- (c) $\overrightarrow{FC} \cap \overrightarrow{FG}$
- (d) $\overline{BD} \cup \overline{DE}$
- (e) $\overline{GE} \cap \overline{CF}$
- (f) $\overleftrightarrow{DH} \cap \overleftrightarrow{EB}$

5. 10 pts. Find the measure of $\angle x$.



6. 10 pts. Find the length of side x and y .



7. 10 pts. Find the shaded area, rounding the answer to the nearest hundredths.

