## Exam 1

Math 135: Intermediate Algebra
October 25, 2007

Instructions: Please write your name on every page. All 8 problems are worth an equal number of points. As always, show your work. Partial credit will be given for incorrect answers with relevant work shown. Credit will not be given for correct answers with no work shown. Good luck!

| Name: |  |
| :--- | :--- |
| Signature: |  |

Do not mark. For grading purposes only.

| Question | Score | Possible |
| :---: | :---: | :---: |
| 1 |  | 10 |
| 2 |  | 10 |
| 3 |  | 10 |
| 4 |  | 10 |
| 5 |  | 10 |
| 6 |  | 10 |
| 7 |  | 10 |
| 8 |  | 80 |
| Total |  |  |

## Useful Formulas

$$
\begin{aligned}
\text { midpoint } & =\left(\frac{x_{1}+x_{2}}{2}, \frac{y_{1}+y_{2}}{2}\right) \\
d & =\sqrt{\left(x_{2}-x_{1}\right)^{2}+\left(y_{2}-y_{1}\right)^{2}} \\
m & =\frac{y_{2}-y_{1}}{x_{2}-x_{1}} \\
y & =m x+b \\
y-y_{1} & =m\left(x-x_{1}\right) \\
m_{\text {perp }} & =-\frac{1}{m}
\end{aligned}
$$

Name:

1. Solve:

$$
\frac{x-2}{3}-\frac{2-x}{5}=3
$$

2. An investor put part of his money in a savings account at an annual return of $3 \%$ and the rest in a mutual fund at an annual return of $8 \%$. He put a total of $\$ 5,000$ into the two accounts. At the end of the year, the investor had $\$ 5,240$. How much money did he invest in each of the two accounts?
3. Solve and graph the solution on a number line: $2-6 x<-4$.

4. Solve, write your answer in interval notation, and graph the solution on a number line: $3 x+2<5$ and $8-2 x<12$.

5. The formula for converting a Farenheit temperature to a Celsius temperature is $C=$ $\frac{5}{9}(F-32)$. A certain chemical reaction can only take place at a temperature below 20 C. For what Farenheit temperatures can the reaction take place?
6. (a) Find the slope and intercepts of the line $3 x+y=6$.
(b) Graph the line.

7. A surveyor is laying out a new path on a college campus. She uses a coordinate system where $x$ is the distance East of the central fountain (in meters) and $y$ is the distance North of the fountain. The path runs between Abel Hall, which is at 10 meters North, -20 meters East, and Baker Hall, which is at 30 meters North, -30 meters East.
(a) Find the distance between the two buildings.
(b) Find the midpoint between them.
(c) Plot the positions of the two buildings and the midpoint between them. Be sure to indicate on your graph which point is which.

8. (a) Find the equation of the line perpendicular to $y=\frac{2}{3} x$ that passes through the point $(2,1)$.
(b) Graph the line.

