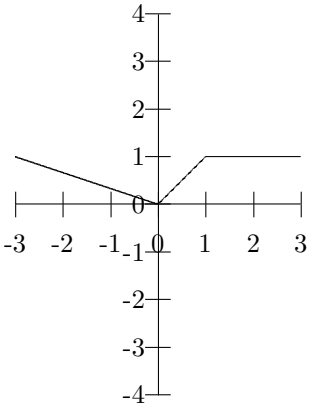
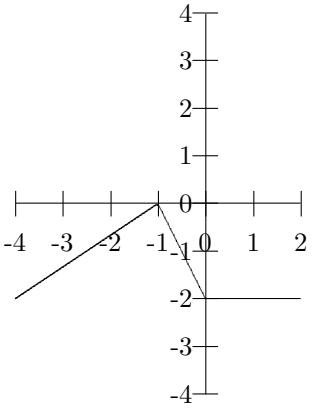
MATH 120 - Autumn 2001
Exam 1, Version 1 - Hints and Answers

1. ANSWER: $(x+3)^2 + (y+8)^2 = 36$
2. ANSWER: $k = -\frac{31}{4}$
3. (a) Domain $= [-3, 3]$, Range $= [0, 1]$



(b) Domain $= [-4, 2]$, Range $= [-2, 0]$



4. HINT: $f(3x) = m(3x) + b$ and $3f(x) = 3(mx + b)$. Set these equal to each other (since you are told that $f(3x) = 3f(x)$) and solve for b. Once you have b, use the fact that $f(x+2) = f(x) + 2$ to solve for m.

   ANSWER: $b = 0$, $m = 1$

5. HINT: This is similar to problem 2.6 in the text.

   ANSWER: $T(x) = \dfrac{\sqrt{25 + (5-x)^2}}{3} + \dfrac{x}{4}$ hours

6. (a) ANSWER: The farmer will use $6x + 2y$ feet of fencing.
   (b) ANSWER: $y = 400 - 3x$
   (c) HINT: The enclosed area is $x \cdot y$ and you just found that $y = 400 - 3x$. You can now write area as a function of only the variable x. This is a quadratic function. Find its vertex.

   ANSWER: The maximum area is $\frac{40{,}000}{3}$ square feet. (It occurs when $x = \frac{200}{3}$.)