

MATH 111 A, B
Winter 2005 - Exam II, Version 1
Hints and Answers

1. (a) (5 points) HINT: $g(x+2) = -3(x+2)^2 + 24(x+2) + 10 = -3x^2 - 12x - 12 + 24x + 48 + 10$;
 $g(x+2) - g(x) = -12x + 36$
ANSWER: $\frac{g(x+2) - g(x)}{2} = 18 - 6x$
- (b) (5 points) HINT: $\frac{g(x) - g(0)}{x} = -3x + 24$
ANSWER: $x = \frac{8}{3}$
- (c) (4 points) HINT: f and g intersect at $x = 0$ and $x = 5$. So, $f(0) = g(0) = 10$ and
 $f(5) = g(5) = 55$, which means that the graph of f goes through the points $(0, 10)$
and $(5, 55)$.
ANSWER: $f(x) = 9x + 10$
- (d) (5 points) HINT: $g(x) - f(x) = -3x^2 + 15x$. Set this equal to 10 and solve for x .
ANSWER: $x = 4.21$
2. (a) (3 points) HINT: The height of the cliff is the height of the potato at $t = 0$.
ANSWER: $h(0) = 103$ feet
- (b) (5 points) HINT: Find the h -coordinate of the vertex of the height function.
ANSWER: 139 feet
- (c) (3 points) HINT: Set the height function equal to 103 and solve for t .
ANSWER: $t = 3$ seconds
3. (4 points each)
- (a) HINT: $78.75 = 90 - K(15)$. Solve for K .
ANSWER: $K = 0.75$
- (b) HINT: $TR(q) = pq = (90 - 0.75q)q = 90q - 0.75q^2$. This is a quadratic function
whose graph is a parabola that opens downward. So, it increases from $q = 0$ to the
 q -coordinate of its vertex.
ANSWER: from $q = 0$ to $q = 60$
- (c) HINT: $TC(q) = AC(q) \times q$ and $FC = TC(0)$.
ANSWER: $FC = TC(0) = 1560$
- (d) HINT: $VC(q) = 0.01q^3 - 1.26q^2 + 52.92q$
ANSWER: $VC(10) = 413.20$
- (e) HINT: profit = $TR - TC = -0.01q^3 + 0.51q^2 + 37.08q - 1560$. Set this equal to 1000
and move everything to one side in such a way so that the coefficient in front of the
 q^3 term is positive.
ANSWER: $0.01q^3 - 0.51q^2 - 37.08q + 2560 = 0$