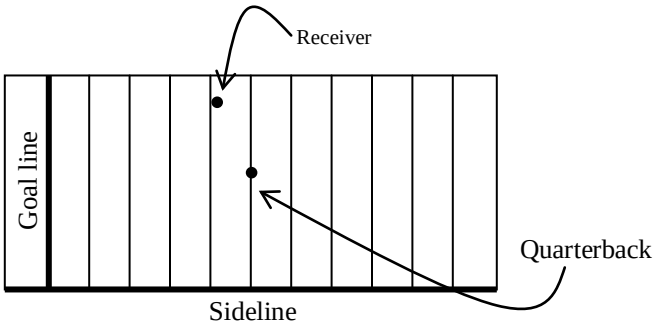
AP Calculus
1.4 Worksheet

All work must be shown in this course for full credit. Unsupported answers may receive NO credit.

1. During a football game, the quarterback held the ball on the 50 yard line while the receiver ran toward the goal line. After waiting 3 seconds, the quarterback threw the ball to the receiver.

Using the intersection of the goal line and the sideline as the origin, let x = the number of yards from the goal line, y = the number of yards from the sideline, and t = the number of seconds the receiver has been running.



The two equations describing the receiver's path are given by $x_1 = 42 - 6t \qquad 0 \le t \le 7.5$

$y_1 = 45 - t$

The two equations describing the path of the ball are given by $x_2 = 50 - 22(t-3) \qquad 3 \le t \le 7.5$

$y_2 = 27 + 6(t-3)$

**These equations give the path of the ball viewed from above. They ignore the height of the ball.

a) Choose an appropriate window and graph the receiver's path. Explain your choice for the window.

b) Graph the path of the ball.

♪: To make sure that the graph doesn't start for 3 seconds, enter $x_2 = 50 - 22(t-3)(t \ge 3)$

$y_2 = 27 + 6(t-3)(t \ge 3)$

c) Assuming the height of the ball is not an issue, does the receiver catch the ball? Explain your reasoning. If not, change the equations above so that the receiver does catch the ball.

2. Complete the following problems from the textbook: page 34 – 36 #5, 7, 9, 11, 12, 13, 14, 23, 25, 41, and 46