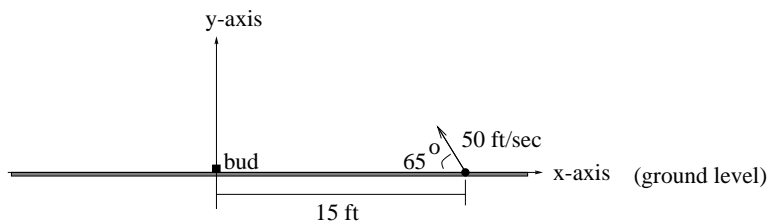
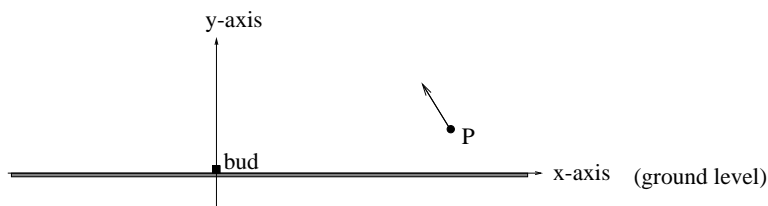


1. (3 pts) You are given the function  $f(x) = 2 \left(\frac{1}{5}\right)^{-x+2}$ . Rewrite the function in the "standard form"  $f(x) = A_0 b^x$  and compute the value  $f(\pi)$ . [ $f(x) = (0.08)5^x$ ;  $f(\pi) = 12.56$ .]
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2. (9 pts) Bud is standing at the origin of the  $xy$ -coordinate system. A ball is kicked from a position 15 ft in front of Bud with the indicated velocity vector. Impose coordinates as pictured.



- (a) (3pts) Resolve the velocity vector; i.e. calculate  $v_x$  and  $v_y$ . [ $v_x = -21.13$  ft/s;  $v_y = 45.32$  ft/s.]
- (b) (4pts) Find parametric equations for the location of the ball at time  $t$ . [ $x(t) = 15 - 21.13t$ ;  $y(t) = -16t^2 + 45.32t$ .]
- (c) (2pts) Find the height of the ball above the ground when it passes directly over Bud's head. [Solve  $0 = x(t)$ , get  $t = 0.71$  sec. Plug into  $y(t)$ , get  $y(0.71) = 24.11$  ft.]
3. (7 pts) Bud is still standing at the origin of the  $xy$ -coordinate system. A DIFFERENT ball is thrown toward Bud and it has parametric equations:  $x(t) = 20 - 20t$ ,  $y(t) = -16t^2 + 50t + 5$ .



- (a) (1pts) Where is the ball initially located? (Find the coordinates of  $P$ .) [Set  $t = 0$ , (20,5)]
- (b) (4pts) Where does this ball hit the ground? (Find the coordinates.) [Solve  $0 = y(t)$ ; get  $t = 3.22$  or  $-0.097$  seconds. Plug into  $x(t)$  function, get  $x(3.22) = -44.4$  ft. Hits at  $(-44.4, 0)$ .]
- (c) (2pts) Find the direction angle for the initial velocity vector of the ball. [  $111.8^\circ$  ]
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4. (1pts) Your Math 120 Professor's name is: (Choose the best answer)

- (a) Richard McCormick  
 (b) Randy Johnson  
 (c) Hermann Maier ← This one  
 (d) Bill Clinton  
 (e) Hillary Clinton  
 (f) Dave Collingwood