

1) Find the most general antiderivative of the following functions.

a) $f(x) = 12x^{\frac{3}{4}} + 6x^{\frac{1}{3}} - 5$

b) $f(x) = (2 - \frac{1}{\sqrt{x}})(2 + \frac{1}{\sqrt{x}})$

c) $f(t) = \frac{t^5 + 2t^4}{\sqrt{t}}$

d) $f(x) = \pi^3 + 15x$

e) $f(t) = e^t + \sec t \tan t + 2$

f) $f(t) = \frac{1}{t^2 + 1} + \frac{1}{\sqrt{1 - t^2}}$

The acceleration of an object dropped or thrown on Earth is $-32 \frac{\text{feet}}{\text{sec}^2}$

- 2) A ball is thrown directly upward at a speed of 40 feet per second from a cliff 100 feet above the ground. (2 points each)
- a) Find expressions for the velocity and height of the ball t seconds after it was released.

 - b) At what time does the ball reach its highest point?

 - c) How high above the ground (from the base of the cliff) does the ball reach?

 - d) When does the ball strike the ground at the base of the cliff?

 - e) What is its velocity at that instant (i.e. when the ball hits the ground)?