Let's try to approximate $\sqrt{7}$ without a calculator

4.5/4.2 Linearization, Differentials, and Antiderivatives

Objectives:

- I can find a general antiderivative
- I can evaluate using differentials
- I can find the linearization of a function

Use an appropriate linearization to approximate $\sqrt{110}$

The linearization of f at a is given by:

$$L(x) = f'(a)(x-a) + f(a)$$

Find the linearization L(x) of f(x) at x=a

$f(x)=x+\frac{1}{x},\ a=1$

Differentials

$\frac{dy}{dx}$ is a notation that represents the derivative.

Separately, dy and dx are called differentials.

Find dy. Then evaluate dy for the given values.

1. $y=\frac{x}{x^2-1},\ x=3, dx=.01$

2. $y=x\sqrt{x-1},\ x=2, dx=.005$

If $f'(x) = 2x + 4$, can we find f(x)??

Consider $f'(x) = 2x + 4$ again. When finding f(x) what information would we need to find C?

Find each general antiderivative

3. $f'(x) = x^2 - 2x$

4. $f'(x) = \sec^2 x$

5. $f'(x) = \dfrac{1}{x+6}, \; x > -6$

Find the particular antiderivative that passes through the point P.

6. $f'(x) = 3x \quad P(1,5)$

7. $f'(x)=\frac{1}{3x^{\frac{2}{3}}}$ $P(8,3)$

8. $f'(x)=x^2+2+\sin x$ $P(0,5)$