

## Exercises

1. Verify that  $e^x \cos(x) \approx 1 + x$  when  $x$  is close to 0.  
[Exercise 10 in Section 3.10]
2. A trough is 10 ft long and its ends have the shape of isosceles triangles that are 3 ft across at the top and have a height of 1 ft. If the trough is being filled with water at a rate of  $12 \text{ ft}^3/\text{min}$ , how fast is the water level rising when the water is 6 inches deep? [Exercise 26 in Section 3.9]
3. Suppose that we don't have a formula for  $g(x)$  but we know that  $g(2) = -4$  and  $g'(x) = \sqrt{x^2 + 5}$  for all  $x$ .
  - (a) Use a linear approximation to estimate  $g(1.95)$  and  $g(2.05)$ .
  - (b) Are your estimates in part (a) too large or too small? Explain.[Exercise 44 in Section 3.10]