

# Math 143 Set 2

1. Find the degree 5 Taylor polynomial for:

- a.  $\cos x$  at  $x = 0$ .
- b.  $1 - 3x^2 + 2x^3 + x^7 + 4x^{10}$  at  $x = 0$ .
- c.  $(x - 1)^2 + (x - 1)^3 + (x - 1)^{1000}$  at  $x = 1$ .
- d.  $\frac{1}{\sqrt{1-x}}$  at  $x = 0$ .
- e.  $(1+x)^\pi$  at  $x = 2$ .
- f.  $\sin(4x)$  at  $x = \pi/2$ .
- g.  $e^{ax}$  at  $x = 0$  where  $a$  is any number.
- h.  $(1-x)^{-3}$  at  $x = 0$ .

2. Find the degree 5 Taylor for  $\sqrt{1+x}$  at  $x = 0$ . This polynomial is the best degree 5 approximation for  $\sqrt{1+x}$  at  $x = 0$ . Evaluate your polynomial at  $x = 1$  to approximate the value of  $\sqrt{1+1} = \sqrt{2}$ . Use a calculator to determine the (absolute) error in using this approximation.

3. Find the degree  $n$  Taylor polynomial for  $\arctan x$  at  $x = 0$ .