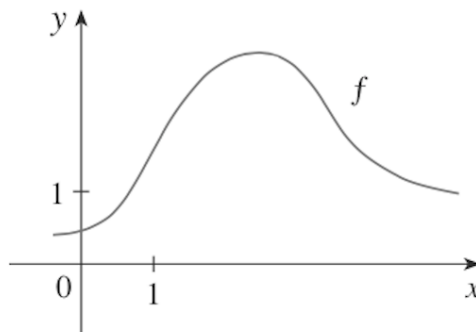**DoNow**

1. A graph of $f(x)$ is shown. Be sure to explain your answers.
   (a) Could the third degree Taylor polynomial for $f(x)$ centered at $a = 1$ be:

   $$1.6 - 0.8(x-1) + 0.4(x-1)^2 - 0.1(x-1)^3$$

   (b) Could the third degree Taylor polynomial for $f(x)$ centered at $a = 2$ be:

   $$2.8 + 0.5(x-2) + 1.5(x-2)^2 - 0.1(x-2)^3$$

Old and New Questions

2. Without consulting your notes, demonstrate how to find the first 4 non-zero terms of the Maclaurin series for:

   (a) e^x

   (b) $\sin(x)$

   (c) $\cos(x)$

   (d) $\dfrac{1}{1-x}$

   (e) $\dfrac{1}{1+x}$

   (f) $\ln(1+x)$

   (g) $\dfrac{1}{1+x^2}$

3. These are converging Maclaurin series. For each series:

   - Write the kth term.
   - Identify the function.
   - Identify the value of x.
   - Find the sum.

   (a) $1 + 1 + \dfrac{1}{2!} + \dfrac{1}{3!} + \dfrac{1}{4!} + \dots$

   (b) $1 - \dfrac{1}{3} + \dfrac{1}{3^2} - \dfrac{1}{3^3} + \dots$

   (c) $\dfrac{1}{2!} - \dfrac{1}{3!} + \dfrac{1}{4!} - \dfrac{1}{5!} + \dots$

   (d) $1 - \dfrac{1}{2} + \dfrac{1}{3} - \dfrac{1}{4} + \dots$

   (e) $1 - \dfrac{1}{3!} + \dfrac{1}{5!} - \dfrac{1}{7!} + \dots$

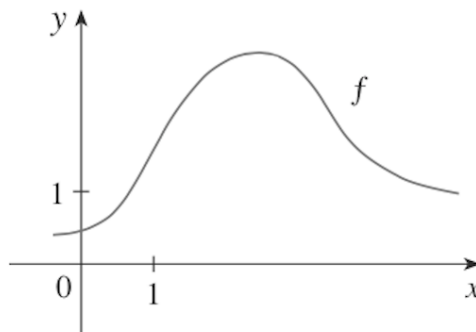   (f) $1 - \dfrac{1}{3} + \dfrac{1}{5} - \dfrac{1}{7} + \dots$

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