

Quiz # 7

Name: Key

*You must show your work to get full credit.*

1. Use your calculator to estimate the following

(a)  $f'(3.2)$  where  $f(x) = xe^{x+1}$ .

Answer: 280.08

$nDeriv(Xe^{(X+1)}, X, 3.2)$

(b)  $\left. \frac{dA}{dt} \right|_{t=-1}$  where  $A(t) = \frac{t+1}{t^2+1}$

Answer: 1.5000

$nDeriv((X+1)/(X^2+1), X, -1)$

2. The cost,  $C$ , in dollars for a local micro brewery to produce its pumpkin-peach beer is a function of the number of gallons,  $g$ , produced. That is  $C = f(g)$ .

(a) If  $f(100) = 452$  then

What are the units of 100? gallons

What are the units of 452? dollars

(b) If  $f'(100) = 2.4$

What are the units of 2.4? dollars/gallon

- (c) Use these values to estimate  $f(102)$

$f(x) \approx f(a) + f'(a)(x-a)$

$f(102) \approx$  \$ 456.80

In our case  $a = 100$

$f(a) = 452, f'(a) = 2.4$

$$\begin{aligned} f(102) &\approx 452 + 2.4(102 - 100) \\ &= 452 + 2.4(2) \\ &= 456.8 \end{aligned}$$