

Review for Quiz 3.1-3.6

These problems provide an overview, but we recommend that you also review all homework problems from the unit.

#1) Find y'' using implicit differentiation. $\sqrt{x} + \sqrt{y} = 1$

#2) Find y'' using implicit differentiation. $x^4 + y^4 = 16$

#3) Find the derivative: $y = (x^2 + 1)\sqrt[3]{x^2 + 2}$ #4) Find the derivative: $f(t) = \sin^2(e^{\sin^2 t})$

#5) Find the derivative: $y = 2^{\sin(\pi x)}$

#6) Find the equation of the tangent line to the curve at the given point: $y = \sin(\sin x)$ $(\pi, 0)$

Use the table for #7, #8, and #9:

x	$F(x)$	$F'(x)$	$F''(x)$	$G(x)$	$G'(x)$	$G''(x)$
3	5	4	-3	2	7	-2
5	8	6	10	-6	-4	11

#7) If $H(x) = (F(x))^2$, then $H'(3) =$

- A) 0 B) 10 C) 25 D) 40 E) 100

#8) If $H(x) = \frac{F(x)}{G(x)}$, then $H'(3) =$

- A) $-\frac{27}{4}$ B) $-\frac{3}{2}$ C) 0 D) $\frac{4}{7}$ E) $\frac{43}{4}$

#9) If $H(x) = \ln(F(x))$, then $H'(3) =$

- A) 0.2 B) 0.25 C) 0.333 D) 0.621 E) 0.8

#10) If $y = e^{x^2}$, then $\frac{d^2y}{dx^2} =$

- A) $(2x)(x^2 - 1)e^{x^2-2}$ B) e^{x^2} C) $2xe^{2x}$ D) $(2+2x)e^{x^2}$ E) $(2+4x^2)e^{x^2}$

#11) Find an equation of the tangent line at the point $P = (1,1)$ to the curve: $y^4 + xy = x^3 - x + 2$

#12) Find the slope of the tangent line at the point $P = (1,1)$ to the curve: $e^{x-y} = 2x^2 - y^2$

#13) If $y - x^2y^2 = 6$, then $\frac{dy}{dx} =$

- A) $\frac{2xy^2}{1-2x^2y}$ B) $\frac{1-2x^2y}{2xy^2}$ C) $\frac{2xy^2}{2x^2y+1}$ D) $\frac{5}{4xy}$ E) $\frac{6+2xy^2}{1+2x^2y}$

#14) If $x^2 + y^2 = 6$, then $\frac{d^2y}{dx^2} =$

- A) $\frac{-6}{y^3}$ B) $-\frac{(x^2 + y^2)}{y^3}$ C) $\frac{6}{y^3}$ D) $\frac{6}{y^2}$ E) $\frac{x-y}{y^2}$

#15) Find the derivative: $y = \sqrt{x^4 + 1}$

#16) Find the derivative: $y = \tan\left(\frac{x}{x+1}\right)$

#17) Find the derivative: $y = (x^2 + 7x + 2)^{\frac{1}{3}}$

#18) Find the derivative: $y = e^{\cos t}$

#19) Find the derivative: $y = \sqrt{1 + \sqrt{x^2 + 1}}$

#20) Find the derivative: $y = 7^{3x^2}$