

# Lesson 12 Worksheet

September 18, 2017

Find the derivative of the following functions using chain rule:

Questions:

1.  $f(x) = \ln(x^2)$

2.  $y = \tan(t^2 - \cos t + 7)$

3.  $y = \tan(t^2 - \cos(2t + 7))$

4.  $g(x) = (3x + 1)^3(x^2 - 1)^4$

5.  $h(y) = (y^2 + 1)\sqrt{y + 2}$

6.  $v(t) = t^2\sqrt{\csc t}$

7.  $y = \ln(\sin x \cos x)$

8.  $\sqrt{x^2 + 1} \ln(4x + 1)$

9.  $\frac{3x \tan x}{(54x^2 - 1)^4}$

Answers:

1.  $\frac{2}{x}$

2.  $(2t + \sin t) \cdot \sec^2(t^2 - \cos t + 7)$

3.  $(2t + 2 \sin(2t + 7)) \cdot \sec^2(t^2 - \cos(2t + 7))$

4.  $9(3x + 1)^2(x^2 - 1)^4 + 8x(3x + 1)^3(x^2 - 1)^3$

5.  $(2y + 1)\sqrt{y + 2} + \frac{y^2 + 1}{2\sqrt{y + 1}}$

6.  $2t\sqrt{\csc t} - \frac{1}{2}t^2(\csc t)^{1/2} \cot t$

7.  $\cot x - \tan x$

8.  $\frac{x \ln(4x + 1)}{\sqrt{x^2 + 1}} + \frac{4\sqrt{x^2 + 1}}{4x + 1}$

9.  $\frac{(54x^2 - 1)(3 \tan x + 3x \sec^2 x) - 1296x^2 \tan x}{(54x^2 - 1)^5}$