Sections 3.5-3.7 MATH 122B

Consider the following table, and answer the below questions:

x	1	2	3	4
$f(x)$	2	4	1	3
$f'(x)$	-6	-7	-8	-9
$g(x)$	2	3	4	1
$g'(x)$	$2/7$	$3/7$	$4/7$	$5/7$

1. If $h(x) = \cos(f(x))$ find $h'(3)$.

2. If $h(x) = \arccos(g(x))$ find $h'(3)$.

3. If $h(x) = \sin(x) \cdot \cos(g(x))$ find $h'(2)$.

4. If $h(x) = \ln(f(x))$ find $h'(4)$.

Find the derivative of the following: (Make sure you can simplify 'enough'... if you were to be asked to solve $f'(x) = 0$ you want a factored form of $f'(x)$ get it to this form as best as you can.)

1. $f(\theta) = \cos\theta \sin\theta$

2. $g(x) = \sqrt{(\sin(2x))^3}$

3. $f(x) = e^{-2x} \cdot \cot x$

4. $h(x) = \sin(\sec x + \tan x)$

5. $f(x) = \sqrt{\dfrac{1 - \sec x}{1 - \csc x}}$

6. $g(x) = \dfrac{\tan^2 x + 1}{\cot^2 x + 1}$

7. $h(x) = \cos(\arctan 3x)$

8. $f(x) = \ln(x^2 + 4x + 7 + \sin x)$

9. $f(x) = \ln(\ln x) + \ln(\ln 2)$

10. $f(x) = \cos(\ln x)$

11. $f(x) = \arctan\left(\dfrac{x}{1+x}\right)$

12. $f(x) = x \arcsin x$

13. $f(x) = e^{\arctan x}$

14. $f(x) = \cos(4)^{\arccos x}$

Use implicit differentiation to find $\dfrac{dy}{dx}$, assume a, b and c are constants.

1. $xy + x + y = a$

2. $x^{2/3} + y^{2/3} = a^{2/3}$

3. $\arctan(x^2 y) = xy^2$

4. $e^{\cos y} = x^3 \arctan y$

5. $x \ln y + y^3 = \ln x$

6. $(x-a)^2 + y^2 = b$

7. $ax + bx^2 + cy + ay^2 = a + \arccos x$

8. $e^{x^2} + \ln y = 0$