

INVERSE TRIGONOMETRIC FUNCTIONS

1. FIND THE EXACT VALUE OF EACH EXPRESSION

a) $\arcsin(\sqrt{3}/2)$

b) $\arccos(-1)$

c) $\arctan(-1)$

d) $\arctan(\sqrt{3})$

e) $\arcsin(-1/\sqrt{2})$

f) $\arcsin(1)$

g) $\arctan(\tan(4\pi/3))$

2. FIND THE DERIVATIVES OF THE FOLLOWING FUNCTIONS

a) $y = \sqrt{\arctan x}$

b) $f(x) = \arctan \sqrt{x}$

c) $h(x) = \sqrt{1-x^2} \arcsin x$

d) $y = x \ln(\arctan x)$

e) $f(x) = \arcsin(2x+1)$

f) $y = (1+x^2) \arctan x$

g) $h(t) = e^{\arccos t}$

h) $y = \arccos(e^{2x})$

i) $y = x \arccos x - \sqrt{1-x^2}$

j) $y = \arctan(\cos \theta)$

ANSWERS:

1 a) $\pi/3$ b) π c) $-\pi/4$ d) $\pi/3$ e) $-\pi/4$

f) $\pi/2$ g) $\pi/3$

2. a) $\frac{dy}{dx} = \frac{1}{2\sqrt{\arctan x}} \cdot \frac{1}{1+x^2}$ b) $f'(x) = \frac{1}{1+x} \cdot \frac{1}{2\sqrt{x}}$

c) $h'(x) = 1 - \frac{x \arcsin x}{\sqrt{1-x^2}}$

d) $y' = x \cdot \frac{1}{\arctan x} \cdot \frac{1}{1+x^2} + \ln(\arctan x) \cdot 1$

e) $h'(x) = \frac{2}{\sqrt{-4x^2-4x}}$

f) $\frac{dy}{dx} = 1 + 2x \arctan x$

g) $h'(t) = -\frac{e^{\arccos t}}{\sqrt{1-t^2}}$

h) $\frac{dy}{dx} = -\frac{2e^{2x}}{\sqrt{1-e^{4x}}}$

i) $y' = \arccos x - \frac{x}{\sqrt{1-x^2}} + \frac{x}{\sqrt{1-x^2}} = \arccos x$

j) $y' = \frac{-\sin \theta}{1+\cos^2 \theta}$