WS ARC TRIG INTEGRATION

Find the equation of the tangent line with the given value of x.

1. $f(x) = \arccos \dfrac{x}{2}$ when x = 1

2. $f(x) = 3\arctan x$ when x = 1

Find the derivative of each.

3. $f(x) = x\sin^{-1} 2x$

4. $f(x) = \cos(\arcsin x)$

5. $f(x) = \dfrac{\arccos 2x}{x}$

6. $f(x) = \arccos\left(\dfrac{1}{4}x\right)$

Integrate.

7. $\displaystyle\int \dfrac{5}{\sqrt{9-x^2}}\,dx$

8. $\displaystyle\int \dfrac{7\,dx}{16+x^2}$

9. $\displaystyle\int \dfrac{dx}{x^2+4x+29}$

10. $\displaystyle\int \dfrac{dx}{x\sqrt{4x^2-1}}$

11. $\displaystyle\int \dfrac{x^3+3}{x^2+1}\,dx$

12. $\displaystyle\int \dfrac{t}{t^4+16}\,dt$

13. $\displaystyle\int \frac{x-3}{x^2+1}dx$

14. $\displaystyle\int_{0}^{1/6} \frac{1}{\sqrt{1-9x^2}}dx$

15. $\displaystyle\int_{0}^{\sqrt{3}/2} \frac{1}{1+4x^2}dx$

16. $\displaystyle\int_{0}^{\pi/2} \frac{\cos x}{1+\sin^2 x}dx$

ANSWERS

1. $y - \dfrac{\pi}{3} = \dfrac{-\sqrt{3}}{3}(x-1)$

2. $y - \dfrac{3\pi}{4} = \dfrac{3}{2}(x-1)$

3. $f'(x) = \sin^{-1}2x + \dfrac{2x}{\sqrt{1-4x^2}}$

4. $f'(x) = \dfrac{-x}{\sqrt{1-x^2}}$

5. $f'(x) = \dfrac{-2x - \sqrt{1-4x^2}\arccos 2x}{x^2\sqrt{1-4x^2}}$

6. $f'(x) = \dfrac{-1}{\sqrt{16-x^2}}$

7. $5\arcsin\left(\dfrac{x}{3}\right) + C$

8. $\dfrac{7}{4}\arctan\dfrac{x}{4} + C$

9. $\dfrac{1}{5}\arctan\dfrac{x+2}{5} + C$

10. $arc\sec|2x| + C$

11. $\dfrac{1}{2}x^2 - \dfrac{1}{2}\ln(x^2+1) + 3\arctan x + C$

12. $\dfrac{1}{8}\arctan\dfrac{t^2}{4} + C$

13. $\dfrac{1}{2}\ln(x^2+1) - 3\arctan x + C$

14. $\dfrac{\pi}{18}$

15. $\dfrac{\pi}{6}$

16. $\dfrac{\pi}{4}$