

Skills Test 2

MA2160 Spring 2007

Solutions

1. $\frac{d}{dx}(\ln x)$

Solution.

$$\frac{d}{dx}(\ln x) = \frac{1}{x}$$

□

2. $\frac{d}{dx}(1)$

Solution.

$$\frac{d}{dx}(1) = 0$$

□

3. $\frac{d}{dx}(9\sqrt{x} - x^7)$

Solution.

$$\frac{d}{dx}(9\sqrt{x} - x^7) = \frac{d}{dx}(9x^{\frac{1}{2}} - x^7) = \frac{9}{2}x^{-\frac{1}{2}} - 7x^6 = \frac{9}{2\sqrt{x}} - 7x^6$$

□

4. $\frac{d}{dx}(e^{\frac{1}{x}})$

Solution.

$$\frac{d}{dx}(e^{\frac{1}{x}}) = e^{\frac{1}{x}} \left(-\frac{1}{x^2} \right) = -\frac{e^{\frac{1}{x}}}{x^2}$$

□

5. $\frac{d}{dx}((\cos x)^7)$

Solution.

$$\frac{d}{dx}((\cos x)^7) = -7(\cos x)^6 \sin x$$

□

6. $\frac{d}{dx}(\arctan x \sin x)$

Solution.

$$\frac{d}{dx}(\arctan x \sin x) = \frac{\sin x}{1+x^2} + \arctan x \cos x$$

□

7. $\int e^{5x} dx$

Solution.

$$\int e^{5x} dx = \frac{e^{5x}}{5} + c$$

□

8. $\int 4 \sin x dx$

Solution.

$$\int 4 \sin x dx = -4 \cos x + c$$

□

9. $\int \left(\frac{1}{x} + x^2\right) dx$

Solution.

$$\int \left(\frac{1}{x} + x^2\right) dx = \ln x + \frac{x^3}{3} + c$$

□

10. $\int \cos(5x) dx$

Solution.

$$\int \cos(5x) dx = \frac{1}{5} \sin(5x) + c$$

□