

12th cbse

November 28, 2023

Questions

1. If $f(x) = \frac{1-x}{1+x}$, then find $f \circ f(x)$.
2. Let W denote the set of words in the English dictionary. Define the relation R by
$$R = \{(x, y) \in W \times W \text{ such that } x \text{ and } y \text{ have at least one letter in common.}\}$$
 Show that this relation R is reflexive and symmetric, but not transitive.
3. Find the inverse of the function $f(x) = \frac{4x}{3x+4}$.
4. $\int x\sqrt{x+2} \, dx$ is equal to
 - (a) $\frac{2}{5}(x+2)^{\frac{5}{2}} - \frac{2}{3}(x+2)^{\frac{3}{2}} + C$
 - (b) $\frac{5}{2}(x+2)^{\frac{5}{2}} + \frac{3}{2}(x+2)^{\frac{3}{2}} + C$
 - (c) $\frac{2}{5}(x+2)^{\frac{5}{2}} - \frac{4}{3}(x+2)^{\frac{3}{2}} + C$
 - (d) $\frac{2}{5}(x+2)^{\frac{5}{2}} + \frac{4}{3}(x+2)^{\frac{3}{2}} + C$where C is the constant of integration.
5. $\int_0^1 \tan(\sin^{-1} x) \, dx$ equals
 - (a) 2
 - (b) 0
 - (c) -1
 - (d) 1

6. $\int \frac{e^x}{x+1} |1 + (x+1)\log(x+1)| dx$ equals

(a) $\frac{e^x}{x+1} + c$

(b) $e^x \frac{e^x}{x+1} + c$

(c) $e^x \log(x+1) + e^x + c$

(d) $e^x \log(x+1) + c$

7. Evaluate: $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{\sin x + \cos x}{\sqrt{\sin 2x}} dx$

8. Find: $\int \frac{x}{(x-1)^2(x+2)} dx$

9. $\int_0^{\frac{\pi}{2}} (\sin^{100} x - \cos^{100} x) dx$ equals

(a) $\frac{\pi}{100}$

(b) 0

(c) $\frac{1}{100}$

(d) $\frac{1^{100}}{(100)^{100}}$

10. $\int \frac{\cos 8x + 1}{\tan 2x - \cot 2x} dx = \lambda \cos 8x + c$, then the value of λ is

(a) $\frac{1}{16}$

(b) $\frac{1}{8}$

(c) $\frac{-1}{16}$

(d) $\frac{-1}{8}$