Calculus Practice: First Fundamental Theorem of Calculus 3a

Evaluate each definite integral.

1) $\int_{\frac{\pi}{4}}^{\frac{2\pi}{3}} \cos x \, dx$

A) $\frac{-\sqrt{3}+\sqrt{2}}{7} \approx -0.045$

B) $\frac{\sqrt{3}-\sqrt{2}}{2} \approx 0.159$

C) $\sqrt{2}+3\sqrt{7} \approx 9.351$

D) $\frac{\sqrt{3}}{2} \approx 0.866$

2) $\int_{0}^{\frac{\pi}{6}} \sec x \tan x \, dx$

A) $\frac{-2+3\sqrt{3}}{3} \approx 1.065$

B) $\frac{-3+2\sqrt{3}}{3} \approx 0.155$

C) $\frac{-3+2\sqrt{3}}{8} \approx 0.058$

D) $\frac{-11+2\sqrt{3}}{3} \approx -2.512$

3) $\int_{\frac{\pi}{2}}^{\pi} -2\cos x \, dx$

A) 2 B) −7

C) 0 D) 4

4) $\int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} -2\csc x \cot x \, dx$

A) −3 B) −2

C) 0 D) 1

5) $\int_{-\frac{\pi}{4}}^{\frac{\pi}{6}} -\sec^2 x \, dx$

A) $-\frac{\sqrt{3}}{3} \approx -0.577$

B) $-\frac{4}{7} \approx -0.571$

C) $-\frac{18}{7} \approx -2.571$

D) $\frac{-3-\sqrt{3}}{3} \approx -1.577$

6) $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} -2\csc x \cot x \, dx$

A) $2-2\sqrt{2} \approx -0.828$

B) −14

C) $2-7\sqrt{3} \approx -10.124$

D) $5-4\sqrt{2} \approx -0.657$

7) $\int_{\frac{\pi}{2}}^{\frac{3\pi}{4}} -\csc x \cot x \, dx$

A) $\sqrt{6}-1 \approx 1.449$

B) $\sqrt{2}-1 \approx 0.414$

C) $\sqrt{2}+2 \approx 3.414$

D) $\sqrt{10}-11 \approx -7.838$

8) $\int_{-\pi}^{\frac{\pi}{2}} \cos x \, dx$

A) −2 B) 1

C) 10 D) −4

9) $\int_{\frac{2\sqrt{3}}{3}}^{2} \frac{1}{4+x^2}\,dx$

A) $\frac{\pi}{4} \approx 0.785$

B) $\frac{\pi}{17} \approx 0.185$

C) $-\frac{\pi}{24} \approx -0.131$

D) $\frac{\pi}{24} \approx 0.131$

10) $\int_{\frac{3}{2}}^{\frac{3\sqrt{2}}{2}} \frac{1}{\sqrt{9-x^2}}\,dx$

A) $-\pi \approx -3.142$

B) $\frac{\pi}{21} \approx 0.15$

C) $\frac{\pi}{12} \approx 0.262$

D) $-\frac{2\pi}{9} \approx -0.698$

11) $\int_{\frac{4\sqrt{3}}{3}}^{2\sqrt{2}} \frac{1}{x\sqrt{x^2-4}}\,dx$

A) $\frac{7\pi}{24} \approx 0.916$

B) $\frac{\pi}{27} \approx 0.116$

C) $\frac{\pi}{24} \approx 0.131$

D) $\frac{\pi}{6} \approx 0.524$

12) $\int_{1}^{\sqrt{3}} \frac{1}{\sqrt{4-x^2}}\,dx$

A) $-\frac{\pi}{3} \approx -1.047$

B) $-\frac{7\pi}{3} \approx -7.33$

C) $\frac{\pi}{6} \approx 0.524$

D) $\frac{7\pi}{6} \approx 3.665$

13) $\int_{2\sqrt{3}}^{6} \frac{1}{x\sqrt{x^2-9}}\,dx$

A) $\frac{\pi}{18} \approx 0.175$

B) $\frac{\pi}{28} \approx 0.112$

C) $\frac{2\pi}{9} \approx 0.698$

D) $-\frac{8\pi}{15} \approx -1.676$

14) $\int_{\frac{2\sqrt{3}}{3}}^{2\sqrt{3}} \frac{1}{4+x^2}\,dx$

A) $-\frac{\pi}{12} \approx -0.262$

B) $\frac{\pi}{12} \approx 0.262$

C) $3\pi \approx 9.425$

D) $\frac{\pi}{3} \approx 1.047$

15) $\int_{\sqrt{3}}^{3\sqrt{3}} \frac{1}{9+x^2}\,dx$

A) $\frac{\pi}{15} \approx 0.209$

B) $\frac{\pi}{18} \approx 0.175$

C) $\frac{\pi}{23} \approx 0.137$

D) $\frac{\pi}{9} \approx 0.349$

16) $\int_{\sqrt{2}}^{2} \frac{1}{x\sqrt{x^2-1}}\,dx$

A) $\frac{\pi}{12} \approx 0.262$

B) $\frac{5\pi}{6} \approx 2.618$

C) $\frac{\pi}{2} \approx 1.571$

D) $\frac{4\pi}{7} \approx 1.795$

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