Definite Integrals

Numberbender | WORKSHEET

Name: _____ Date: _____ Score: _____

Evaluate each definite integral. Show all work.

Calc 1 Worksheet #25
Definite Integrals

Learn: Definite Integrals

Examples:

1. $\int_1^4 -x^{-2}dx \Rightarrow\Rightarrow \frac{-x^{-1}}{-1}+c \Rightarrow\Rightarrow \frac{1}{x}+c\Big|_1^4 \Rightarrow \left(\frac{1}{4}+c\right)-\left(\frac{1}{1}+c\right)=\frac{1}{4}+c-1-c=\frac{1}{4}-1=\boxed{\frac{-3}{4}}$

2. $\int_\pi^{2\pi} \sin x dx \Rightarrow\Rightarrow -\cos x+c\Big|_\pi^{2\pi} \Rightarrow (-\cos 2\pi+c)-(-\cos\pi+c) \Rightarrow -\cos 2\pi+c+\cos\pi-c \Rightarrow$

$-\cos 2\pi+\cos\pi=-(1)+(-1)=\boxed{-2}$

3. $\int_1^e \frac{1}{x}dx \Rightarrow\Rightarrow \ln|x|+c\Big|_1^e \Rightarrow (\ln|e|+c)-(\ln|1|+c)=\ln(e)+c-\ln(1)-c=\ln(e)-\ln(1)=1-0=\boxed{1}$

Problems:

1. $\int_0^3 (2x-1)\ dx$	2. $\int_0^2 (4-x)\ dx$	3. $\int_1^2 (4t-5)\ dt$
4. $\int_1^3 (2x+3)\ dx$	5. $\int_{-3}^0 (x^2+2x-2)\ dx$	6. $\int_{-2}^2 (s^3-3s^2+2)\ ds$
7. $\int_1^2 \frac{dx}{x}$	8. $\int_1^e \frac{dx}{x}$	9. $\int_e^{e^2} \frac{du}{u}$
10. $\int_{1/e}^e \frac{dt}{t}$	11. $\int_0^1 e^x\ dx$	12. $\int_0^{\ln 2} e^u\ du$
13. $\int_{-\pi/2}^{\pi/2} \cos\theta\ d\theta$	14. $\int_0^\pi \sin\alpha\ d\alpha$	15. $\int_0^{\ln 2} e^{-t}\ dt$
16. $\int_0^2 \frac{dx}{4-x}$	17. $\int_{-2}^0 \frac{dx}{1-x}$	18. $\int_0^{\pi/4} \cos 2\theta\ d\theta$
19. $\int_0^{\pi/6} \sin 2\theta\ d\theta$	20. $\int_0^{\pi/4} \tan t\ dt$	21. $\int_0^{\pi/2} \frac{\cos\theta}{1+\sin\theta}\ d\theta$

Answer key — for instructor use only.

Answers:

1. 6	2. 6	3. 1	4. 14	5. –6	6. –8	7. $\ln 2$
8. 1	9. 1	10. 2	11. e –1	12. 1	13. 2	14. 2
15. $\frac{1}{2}$	16. $\ln 2$	17. $\ln 3$	18. $\frac{1}{2}$	19. $\frac{1}{4}$	20. $\ln\sqrt{2}$	21. $\ln 2$