

# Calculus 2

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Reference: Varberg, Purcell, Rigdon (ninth edition) . *Calculus*.



1.  $D_x \cosh(2x + 3)$

a.  $-2 \operatorname{sech}(2x + 3)$

b.  $2 \cosh(2x + 3)$

c.  $2 \sinh(2x + 3)$

d.  $2 \operatorname{sech}(2x + 3)$



## 2. $D_x \operatorname{sech}(3x^2)$

- a.  $3x \sinh(3x^2)$
- b.  $-6x \operatorname{csch}(3x^2) \coth(3x^2)$
- c.  $3x \operatorname{csch}(3x^2)$
- d.  $-6x \operatorname{sech}(3x^2) \tanh(3x^2)$



3.  $\cosh(x) + \sinh(x)$

a.  $x$

b.  $2e^x$

c.  $e^{-x}$

d.  $e^x$



4.  $\int \tanh x \, dx$

a.  $\ln |\cosh x| + c$

b.  $\operatorname{csch} x + c$

c.  $\operatorname{coth} x + c$

d.  $\cosh^2 x + c$



5.  $1 - \tanh^2 x$

*a.*  $\operatorname{sech}^2 x$

*b.*  $\cosh^2 x$

*c.*  $\operatorname{csch}^2 x$

*d.*  $\sinh^2 x$



6.  $\int \ln x \, dx$

a.  $x \ln(x) - x + c$

b.  $-x \ln(x) + c$

c.  $\frac{x}{2} \ln(x) + c$

d.  $\ln(x) + c$



7.  $\int x \sin 3x \, dx$

- a.  $-x \cos 3x + \sin 3x + c$
- b.  $\frac{1}{3}x \cos 3x - \frac{1}{9} \sin 3x + c$
- c.  $-\frac{1}{3}x \cos 3x + \frac{1}{9} \sin 3x + c$
- d.  $x \cos 3x - \sin 3x + c$





8. *Decompose*  $\frac{4x - 8}{(x - 1)(x - 3)}$

a.  $\frac{\frac{3}{4}}{x - 1} + \frac{\frac{1}{4}}{x - 3}$

b.  $\frac{2}{x - 1} + \frac{2}{x - 3}$

c.  $\frac{\frac{1}{4}}{x - 1} + \frac{\frac{1}{4}}{x - 3}$

d.  $\frac{2}{x - 1} - \frac{2}{x - 3}$



$$9. \int \frac{4x - 8}{(x - 1)(x - 3)} dx$$

$$a. \quad 2 \ln |(x - 1)| - 2 \ln |x - 3| + c$$

$$b. \quad 2 \ln |(x - 1)| + 2 \ln |x - 3| + c$$

$$c. \quad x \ln |x - 1| + c$$

$$d. \quad \ln |(x - 1)| - \frac{1}{x - 3} + c$$



$$10. \lim_{x \rightarrow 0} \frac{\tan^{-1}(2x)}{x}$$

*a.*     2

*b.*      $\frac{\sqrt{2}}{2}$

*c.*      $\pi$

*d.*      $\frac{\pi}{2}$



11.  $\lim_{x \rightarrow 0} \frac{\ln(2 + x - e^{2x})}{x}$

a. 2

b. 1

c. -2

d. -1



12.  $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2}$

a. 0

b. 2

c. 1

d.  $\frac{1}{2}$



13.  $\lim_{x \rightarrow \infty} \frac{x^2}{\ln x}$

a. 0

b. 2

c. 1

d.  $\infty$



14.  $\lim_{x \rightarrow \infty} \frac{x^{3.2}}{e^x}$

a.  $\infty$

b. 2

c. 1

d. 0



15.  $\lim_{x \rightarrow \infty} \frac{1 - 3x^2}{2x^2 - 1}$

a. 1

b. 0

c.  $-\frac{3}{2}$

d. 2





16.  $\lim_{x \rightarrow \infty} (xe^{-x})$

a. 0

b.  $\frac{1}{3}$

c. 1

d.  $\infty$



17.  $\int_{-\infty}^{\infty} \frac{1}{1+x^2} dx$

a.  $\frac{\pi}{2}$

b.  $2\pi$

c.  $\pi$

d.  $1$

18.  $\int_0^{\infty} \frac{2x}{1+x^2} dx$

a. 2

b.  $\infty$

c.  $\frac{\pi}{2}$

d.  $\pi$

19.  $\int_0^{\infty} \frac{2x}{(x^2 + 4)^{\frac{3}{2}}} dx$

a. 2

b.  $\frac{3}{2}$

c.  $\frac{2}{3}$

d. 1

20.  $\int_0^1 \frac{1}{(1-x)^3} dx$

*a.*  $\infty$

*b.*  $6$

*c.*  $2$

*d.*  $-\infty$