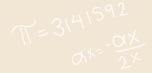




MATH 100: Differential Calculus

Supplemental Learning







There will be two SL sessions held each week:

In-Person: Monday, 9:30 a.m. - 11 a.m., LIB 237

(Enter from the Library West Entrance and come up a floor to the Student Learning Hub)

Online: Wednesday, 12:00 p.m. - 1:00 p.m., on Zoom

Zoom Link: https://ubc.zoom.us/j/61758025867?pwd=cGV3d05HNjgweUlsNjBEZzA1d0Z6QT09

Meeting ID: 726 091 5421

Passcode: 129010

Office Hours: Monday, 11:00 a.m. - 11:30 a.m., LIB 237

Algebra Identities

$$\bullet \ \sin(2x) = 2\sin(x)\cos(x)$$

$$\bullet \cos^2(x) = \frac{1 + \cos(2x)}{2}$$

 \bullet $a^{x+y} = a^x a^y$

$$\bullet \sin^2(x) = \frac{1 - \cos(2x)}{2}$$

$$\bullet \ a^{xy} = (a^x)^y = (a^y)^x$$

•
$$\log_a(xy) = \log_a(x) + \log_a(y)$$

•
$$\log_a(x/y) = \log_a(x) - \log_a(y)$$

•
$$\log_a(x^n) = n \log_a(x)$$

•
$$ax^2 + bx + c = 0 \implies x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Quiz 1!

Limits

Friday, September 22nd



Introduction to Limits

Graphical Limits

Vertical Asymptotes

One-sided Limits Algebraic
Techniques for
Limits

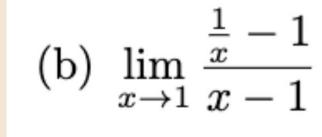
Limits at Infinity



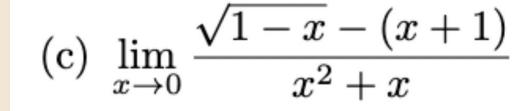
1. Calculate the following limits.

(a)
$$\lim_{x \to -4} \frac{x^2 + 4x}{x^2 + 2x - 8}$$



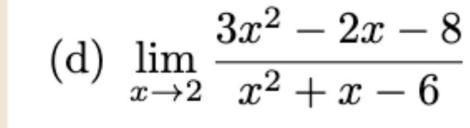




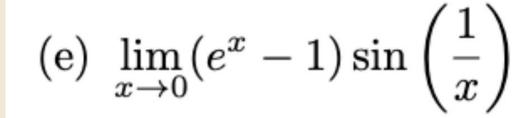
















2. Determine all vertical asymptotes of $f(x) = \frac{x-1}{x^2-5x+6}$. Then determine the infinite behaviour of f(x) on both sides of each asymptote.

3. Determine the values of a and b that makes the function below continuous everywhere

$$f(x) = \begin{cases} ax + b & \text{if } x \le 1\\ ax^2 - bx + 1 & \text{if } x > 1 \end{cases}$$



Additional Exercises

Openstax:

- Examples 2.17, 2.18, 2.19 on pages 165/166
- 2.3 Exercises: 96, 97, 101, 102

APEX:

- Exercises 1.3: 7, 9, 12, 14, 29, 30, 35, 36, 38
- Exercises 1.4: 8, 11, 13, 14, 15, 20
- Exercises 1.5: 12, 17, 20, 22, 23, 24, 26, 29
- Exercises 1.6: 19, 20, 22, 24 (only vertical asymptotes)

Any Questions????