

**Math 100. Quiz 1. 2017-09-22 Friday (vf-d) Time 25min**

Section ..... Instructor name .....

Your email .....

- **For each computation of limits in this test, if the limit does not exist, indicate whether it diverges to  $-\infty$  or  $+\infty$ .**
- Simplify all your answers as much as possible and express answers in terms of fractions or constants such as  $\frac{1}{100}$ ,  $\sqrt{e}$  or  $\ln(4)$  rather than decimals.

1. Each part of this question is worth 1 mark, and the correct answer will get the full mark.

(a) (1 pt) Compute

$$\lim_{x \rightarrow -2} \sqrt{1 - x^3}$$

(b) (1 pt) Compute

$$\lim_{x \rightarrow +\infty} \frac{5x^2 + x - 6}{3x^2 - 7x + 2}$$

2. Each part of this question is worth 2 marks. **You have to show all your work in order to get credit.**

(a) **(2 pts)** Compute

$$\lim_{x \rightarrow -2} \frac{|x + 2|}{x^2 - 4}$$

(b) **(2 pts)** Compute

$$\lim_{x \rightarrow 1} \frac{\sqrt{x + 3} - 2}{x - 1}$$

- 3.** This question is worth 4 marks. **You have to show all your work in order to get credit.**

Find the real number  $a$  such that  $\lim_{x \rightarrow 1} f(x)$  exists for the function

$$f(x) = \begin{cases} (x - 1) \cdot \sin\left(\frac{1}{x-1}\right) & \text{if } x > 1 \\ x^2 + ax + 1 & \text{if } x < 1. \end{cases}$$

**Math 100. Quiz 1. 2017-09-22 Friday (vf-p) Time 25min**

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- **For each computation of limits in this test, if the limit does not exist, indicate whether it diverges to  $-\infty$  or  $+\infty$ .**
- Simplify all your answers as much as possible and express answers in terms of fractions or constants such as  $\frac{1}{100}$ ,  $\sqrt{e}$  or  $\ln(4)$  rather than decimals.

1. Each part of this question is worth 1 mark, and the correct answer will get the full mark.

(a) **(1 pt)** Compute

$$\lim_{x \rightarrow 2} \frac{1 - x^2}{\sqrt{1 + x^3}}$$

(b) **(1 pt)** Compute

$$\lim_{x \rightarrow +\infty} \frac{1 - 5x + 2x^3}{2 + 4x^2 - x^3}$$

2. Each part of this question is worth 2 marks. **You have to show all your work in order to get credit.**

(a) **(2 pts)** Compute

$$\lim_{x \rightarrow -1} \frac{x^2 + 3x + 2}{|x + 1|}$$

(b) **(2 pts)** Compute

$$\lim_{x \rightarrow -2} \frac{1 - \sqrt{x + 3}}{x + 2}$$

- 3.** This question is worth 4 marks. **You have to show all your work in order to get credit.**

Find the real number  $a$  such that  $\lim_{x \rightarrow 0} f(x)$  exists for the function

$$f(x) = \begin{cases} a(x+1)^2 - 1 & \text{if } x > 0 \\ 1 + x^2 \cos\left(\frac{1}{x}\right) & \text{if } x < 0. \end{cases}$$



**Math 100. Quiz 1. 2017-09-22 Friday (vf-n) Time 25min.**

Section ..... Instructor name .....

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- **For each computation of limits in this test, if the limit does not exist, indicate whether it diverges to  $-\infty$  or  $+\infty$ .**
- Simplify all your answers as much as possible and express answers in terms of fractions or constants such as  $\frac{1}{100}$ ,  $\sqrt{e}$  or  $\ln(4)$  rather than decimals.

1. Each part of this question is worth 1 mark, and the correct answer will get the full mark.

(a) **(1 pt)** Compute

$$\lim_{x \rightarrow 5} \sqrt[3]{x^2 - 17}$$

(b) **(1 pt)** Compute

$$\lim_{x \rightarrow -\infty} \frac{-5x^2 + x - 2}{-3x^2 - 7x + 3}$$

2. Each part of this question is worth 2 marks. **You have to show all your work in order to get credit.**

(a) **(2 pts)** Compute

$$\lim_{x \rightarrow 2} \frac{|x - 2|}{x^2 - 3x + 2}$$

(b) **(2 pts)** Compute

$$\lim_{x \rightarrow 1} \frac{\sqrt{x + 8} - 3}{1 - x}$$

3. This question is worth 4 marks. **You have to show all your work in order to get credit.**

Find the real number  $a$  such that  $\lim_{x \rightarrow 1} f(x)$  exists for the function

$$f(x) = \begin{cases} (x - 1) \cdot \cos\left(\frac{1}{x-1}\right) & \text{if } x > 1 \\ x^2 - 1 + a & \text{if } x < 1. \end{cases}$$