# Functions

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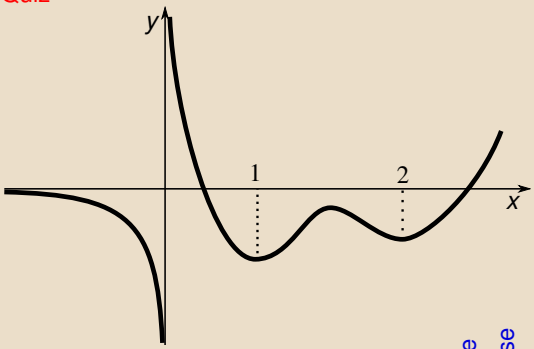
Look at three or four or twenty my quizzes and then fill in my questionnaire please!

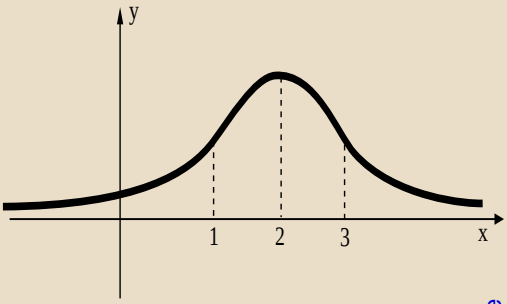
Quiz




The function on the picture ...

| | True | False |
|---|---|---|
| **1.** ... is defined on $\mathbb{R}$. | ☐ | ☐ |
| **2.** ... is undefined and continuous at $x = 0$. | ☐ | ☐ |
| **3.** ... has a discontinuity at $x = 0$. | ☐ | ☐ |
| **4.** ... is continuous on the set $(-\infty, 0) \cup (0, \infty)$. | ☐ | ☐ |
| **5.** ... is bounded above. | ☐ | ☐ |
| **6.** ... is bounded below on $(1, \infty)$. | ☐ | ☐ |
| **7.** ... is decreasing on $(-\infty, 1)$. | ☐ | ☐ |
| **8.** ... is increasing on $(1, 2)$. | ☐ | ☐ |
| **9.** ... is continuous and increasing on $(0, \infty)$. | ☐ | ☐ |
| **10.** ... is decreasing on $(0, 1)$. | ☐ | ☐ |
| **11.** ... possesses three local minima. | ☐ | ☐ |
| **12.** ... possesses one local maximum. | ☐ | ☐ |
| **13.** ... possesses no point of inflection. | ☐ | ☐ |
| **14.** ... possesses two point of inflection on the interval $(1, 2)$. | ☐ | ☐ |
| **15.** ... possesses one point of inflection on $(0, 1)$. | ☐ | ☐ |
| **16.** ... is concave down on $(-\infty, 0)$. | ☐ | ☐ |
| **17.** ... satisfies $\lim_{x \to -\infty} f(x) = -\infty$. | ☐ | ☐ |
| **18.** ... satisfies $\lim_{x \to 0} f(x) = -\infty$. | ☐ | ☐ |
| **19.** ... satisfies $\lim_{x \to \infty} f(x) = \infty$. | ☐ | ☐ |

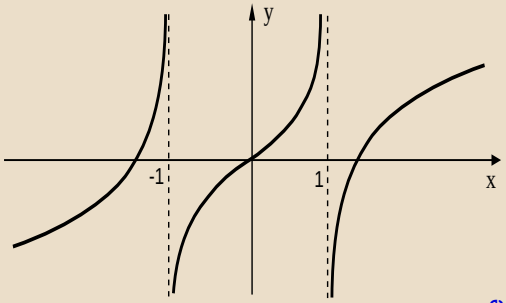
Quiz




The function on the picture ... | True | False

1. ... is defined on $\mathbb{R}$. ☐ ☐
2. ... has one point of discontinuity. ☐ ☐
3. ... is not one-to-one on $\mathbb{R}$. ☐ ☐
4. ... is one-to-one and decreasing on $(2,\infty)$. ☐ ☐
5. ... is odd. ☐ ☐
6. ... is even. ☐ ☐
7. ... is continuous on $\mathbb{R}$. ☐ ☐
8. ... possesses three local extrema. ☐ ☐
9. ... possesses a unique local extremum. ☐ ☐
10. ... is increasing on $(0,2)$. ☐ ☐
11. ... possesses no local extremum on $(0,2)$. ☐ ☐
12. ... is concave up on $(0,2)$. ☐ ☐
13. ... possesses two points of inflection. ☐ ☐
14. ... possesses three points of inflection. ☐ ☐
15. ... possesses no point of inflection on $(0,2)$. ☐ ☐
16. ... possesses no point of inflection on $(1,3)$. ☐ ☐
17. ... satisfies $\lim_{x\to-\infty} f(x) = 0$. ☐ ☐
18. ... satisfies $\lim_{x\to 2} f(x) = +\infty$. ☐ ☐
19. ... possesses no derivative at $x = 2$. ☐ ☐

Quiz

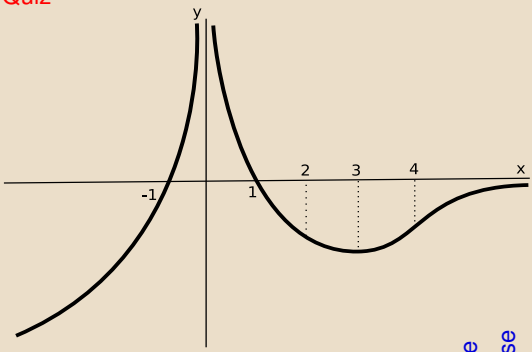



The function on the picture ... (True / False)

1. ... is well-defined on $\mathbb{R}$.
2. ... possesses one point of discontinuity.
3. ... possesses two points of discontinuity.
4. ... is even.
5. ... is odd.
6. ... possesses four local extrema.
7. ... possesses two local extrema.
8. ... possesses no local extremum.
9. ... possesses one point of inflection.
10. ... possesses three points of inflection.
11. ... is increasing on $(-1,1)$.
12. ... is increasing on $(1,\infty)$.
13. ... is concave up on the intervals $(-\infty,-1)$ and $(0,1)$ and concave down on the intervals $(-1,0)$ and $(1,\infty)$.
14. ... is one-to-one on $(-1,1)$.
15. ... possesses no limit at $x=1$.
16. ... satisfies $\lim_{x\to 1^+} f(x) = 0$.
17. ... satisfies $\lim_{x\to -1^-} f(x) = +\infty$.
18. ... possesses no stationary point (a point with vanishing derivative).
19. ... is bounded below on $(0,1)$.

ROBERT MAŘÍK
Functions
file vlastnosti-funkci.tex

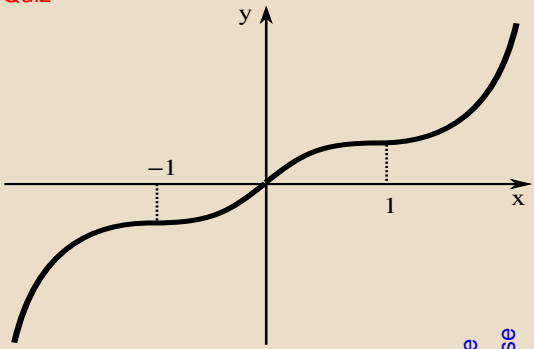
Quiz




The function on the picture . . .

| | True | False |
|---|---|---|
| **1.** . . . is well-defined on $\mathbb{R}$. | ☐ | ☐ |
| **2.** . . . possesses one point of discontinuity. | ☐ | ☐ |
| **3.** . . . possesses three points of discontinuity. | ☐ | ☐ |
| **4.** . . . is even. | ☐ | ☐ |
| **5.** . . . is odd. | ☐ | ☐ |
| **6.** . . . has unique $x$-intercept. | ☐ | ☐ |
| **7.** . . . has unique $y$-intercept. | ☐ | ☐ |
| **8.** . . . is bounded below. | ☐ | ☐ |
| **9.** . . . is bounded below on $(0,1)$. | ☐ | ☐ |
| **10.** . . . is bounded on $(0,1)$. | ☐ | ☐ |
| **11.** . . . is bounded on $(1,\infty)$. | ☐ | ☐ |
| **12.** . . . is one-to-one on $(-\infty,0)$. | ☐ | ☐ |
| **13.** . . . is one-to-one on $(0,\infty)$. | ☐ | ☐ |
| **14.** . . . is one-to-one. | ☐ | ☐ |
| **15.** . . . possesses one local extremum. | ☐ | ☐ |
| **16.** . . . possesses one local maximum. | ☐ | ☐ |
| **17.** . . . possesses one local minimum. | ☐ | ☐ |
| **18.** . . . is increasing on $(-\infty,0)$. | ☐ | ☐ |
| **19.** . . . is increasing on $(2,\infty)$. | ☐ | ☐ |
| **20.** . . . is decreasing at $x=0$. | ☐ | ☐ |
| **21.** . . . is increasing at $x=1$. | ☐ | ☐ |
| **22.** . . . is increasing at $x=3$. | ☐ | ☐ |
| **23.** . . . is increasing at $x=4$. | ☐ | ☐ |
| **24.** . . . is continuous at $x=1$. | ☐ | ☐ |
| **25.** . . . satisfies $\lim_{x\to-1} f(x)=0$. | ☐ | ☐ |
| **26.** . . . satisfies $\lim_{x\to0} f(x)=\infty$. | ☐ | ☐ |
| **27.** . . . satisfies $\lim_{x\to-\infty} f(x)=0$. | ☐ | ☐ |
| **28.** . . . satisfies $\lim_{x\to\infty} f(x)=\infty$. | ☐ | ☐ |
| **29.** . . . possesses no stationary point (a point with vanishing derivative). | ☐ | ☐ |
| **30.** . . . possesses one point of inflection. | ☐ | ☐ |
| **31.** . . . is concave up on $(1,\infty)$ | ☐ | ☐ |
| **32.** . . . is concace up on $(2,4)$ | ☐ | ☐ |
| **33.** . . . is concave up at $x=1$ | ☐ | ☐ |

Quiz




The function on the picture ...

| | True | False |
|---|---|---|
| **1.** ... is well-defined on $\mathbb{R}$. | ☐ | ☐ |
| **2.** ... possesses one point of discontinuity. | ☐ | ☐ |
| **3.** ... is even. | ☐ | ☐ |
| **4.** ... is odd. | ☐ | ☐ |
| **5.** ... has unique $x$-intercept. | ☐ | ☐ |
| **6.** ... has unique $y$-intercept. | ☐ | ☐ |
| **7.** ... is bounded below. | ☐ | ☐ |
| **8.** ... is bounded below on $(0,1)$. | ☐ | ☐ |
| **9.** ... is bounded on $(0,1)$. | ☐ | ☐ |
| **10.** ... is bounded above on $(1,\infty)$. | ☐ | ☐ |
| **11.** ... is bounded below on $(1,\infty)$. | ☐ | ☐ |
| **12.** ... is one-to-one. | ☐ | ☐ |
| **13.** ... possesses one local extremum. | ☐ | ☐ |
| **14.** ... has neither local maximum nor local minimum. | ☐ | ☐ |
| **15.** ... is increasing on $(-\infty,-1)$. | ☐ | ☐ |
| **16.** ... is increasing (on $\mathbb{R}$). | ☐ | ☐ |
| **17.** ... is continuous at $x=1$. | ☐ | ☐ |
| **18.** ... is continuous (on $\mathbb{R}$). | ☐ | ☐ |
| **19.** ... satisfies $\lim_{x\to-1} f(x)=0$. | ☐ | ☐ |
| **20.** ... satisfies $\lim_{x\to0} f(x)=0$. | ☐ | ☐ |
| **21.** ... satisfies $\lim_{x\to-\infty} f(x)=0$. | ☐ | ☐ |
| **22.** ... satisfies $\lim_{x\to\infty} f(x)=\infty$. | ☐ | ☐ |
| **23.** ... possesses no stationary point (a point with vanishing derivative). | ☐ | ☐ |
| **24.** ... possesses one point of inflection. | ☐ | ☐ |
| **25.** ... possesses two points of inflection. | ☐ | ☐ |
| **26.** ... possesses three points of inflection. | ☐ | ☐ |
| **27.** ... is concave down on $(-1,1)$ | ☐ | ☐ |
| **28.** ... is concave up on $(1,\infty)$ | ☐ | ☐ |
| **29.** ... is concave up at $x=1$ | ☐ | ☐ |