

20100 Calculus I, Spring 2003

Test 1, February 18, 2003

1a	1b	1c	2a	2b	2c	2d	3a	3b	3c	4a	4b	5	6a	6b
7a	7b	7c	7d	7e	7f	8a	8b	8c	8d	8e	8f	8g	8h	8i
9a	9b	9c	9d	9e	9f	9g	9h	9i	9j	9k	9l			
10a	10b	10c	10d	Total										

Full name:

Student ID:

Statement of integrity: I did not, and will not, break the rules of academic integrity on this test.

Signature

Show all your work. To the left of each question the number of points, it is worth, is shown in parentheses. You can solve problems in any order, three last problems have the highest value. Good luck!

1. Solve inequalities:

(3) (a) $x^2 + 3x - 4 \geq 0$

(3) (b) $x^2 < 3$

(3) (c) $x^2 + 3x + 4 \leq 0$

2. For the line $x - 2y + 3 = 0$ find:

(2) (a) slope

(2) (b) y -intercept

(2) (c) slope of a line perpendicular to $x - 2y + 3 = 0$

(2) (d) equation of the line perpendicular to $x - 2y + 3 = 0$ with x -intercept equal to 1

3. For the circle $x^2 + y^2 + 10x - 6y = 2$ find:

(2) (a) center

(2) (b) radius

(3) (c) sketch the region $x^2 + y^2 + 10x - 6y \leq 2$

4. For an angle θ such that $\tan \theta = -\frac{1}{3}$

(3) (a) find $\sin \theta, \cos \theta, \cot \theta$ assuming $\frac{\pi}{2} < \theta < \pi$

(4) (b) from what quadrants an angle ϕ could be if $\sin \phi = \sin \theta$?

5. (3) Find the domain of the function $f(x) = \sqrt{3 + 2x}$.

6. Which of the following functions are even, odd, or neither? Explain.

(3) (a) $\sin x$

(4) (b) $x + \sin x$

7. Classify the following functions:

(1) (a) $x^2 + \log_2 x$

(1) (b) $\tan x$

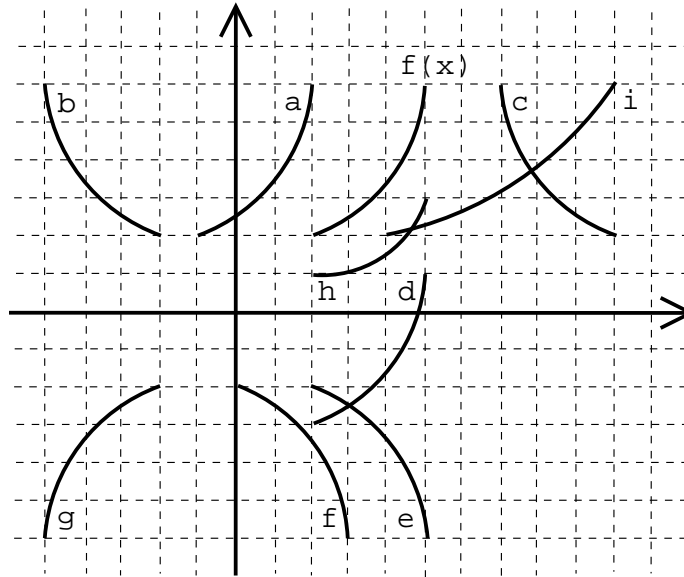
(1) (c) $\cot 2x$

(1) (d) $\frac{x^2+3}{x-1}$

(1) (e) $\frac{x^2+3}{\sqrt{x}}$

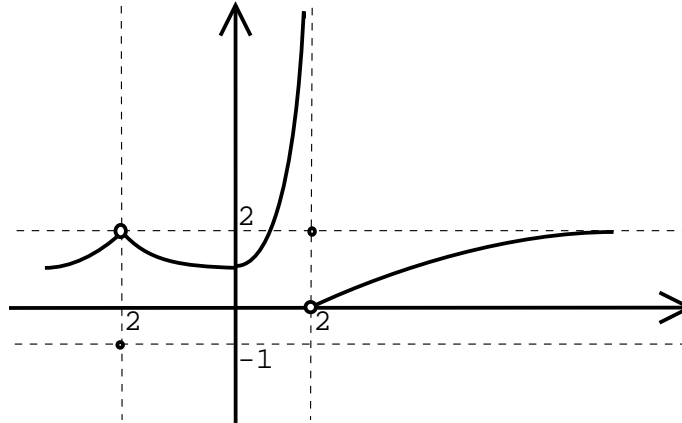
(1) (f) $\frac{3^x}{2}$

8. For each transformation of the original function $y = f(x)$ presented on the picture find its analytical representation (for example for the shift 2 units distance to the left the answer would be $f(x + 2)$):



- (1) (a)
- (2) (b)
- (2) (c)
- (1) (d)
- (2) (e)
- (2) (f)
- (3) (g)
- (3) (h)
- (3) (i)

9. Find the value of a limit/function or state that it's not defined:



(2) (a) $f(2)$

(2) (b) $\lim_{x \rightarrow 2^-} f(x)$

(2) (c) $\lim_{x \rightarrow 2^+} f(x)$

(2) (d) $\lim_{x \rightarrow 2} f(x)$

(2) (e) $f(-2)$

(2) (f) $\lim_{x \rightarrow -2^-} f(x)$

(2) (g) $\lim_{x \rightarrow -2^+} f(x)$

(2) (h) $\lim_{x \rightarrow -2} f(x)$

(2) (i) $f(0)$

(2) (j) $\lim_{x \rightarrow 0^-} f(x)$

(2) (k) $\lim_{x \rightarrow 0^+} f(x)$

(2) (l) $\lim_{x \rightarrow 0} f(x)$

10. For $f(x) = \frac{1}{1-\frac{1}{2^x}}$ find the value of the limit/function or state that it's not defined:

(2) (a) $\lim_{x \rightarrow 0^+} f(x)$

(2) (b) $\lim_{x \rightarrow 0^-} f(x)$

(2) (c) $\lim_{x \rightarrow 0} f(x)$

(2) (d) $f(0)$