MATH 221: Calculus and Analytic Geometry
Prof. Ram, Fall 2006

HOMEWORK 5: SELECTED ANSWERS

Problem A. Evaluating limits when $x \to 0$.

(1) 10

(2) 5

(3) 17/2

(4) $-317/422$

(5) $-3/5$

(6) $\dfrac{1}{2\sqrt{x}}$

(7) 1/2

(8) $\sqrt{2}/4$

(9) $-(1/2)x^{-3/2}$

(10) $2\sqrt{a}$

(11) 1/2

(12) 2

(13) 1

(14) $\dfrac{a}{2\sqrt{ax+b}}$

(15) $mn(mx+c)^{n-1}$

Problem B. Evaluating limits when $x \to a$.

(1) 5

(2) 14

(3) -2

(4) -11

(5) 3

(6) 1/2

(7) 4

(8) 108

(9) 3125

(10) $12a^{1}1$

(11) $(5/2)a^{3/2}$

(12) $(5/3)(a+2)^{2/3}$

(13) 6

(14) 20/3

(15) n

(16) $\dfrac{1}{2\sqrt{a}}$

(17) 1/2

(18) $\dfrac{2\sqrt{3}}{9}$

(19) na^{n-1}

Problem C. Evaluating limits as $x \to \infty$.

(1) 1

(2) 3/5

(3) 1/3

(4) 2/7

(5) 12

(6) 1/2

(7) 1/2

(8) 0

(9) e

(10) 0

(11) 0

(12) 1/2

Problem D. Limits with exponential and log functions.

(1) 1

(2) $\ln a$

(3) 1

(4) e

(5) $\ln a - \ln b$

(6) 1

(7) 0

1

(11) $\dfrac{1}{2\sqrt{x}}\, e^{\sqrt{x}}$ (12) $\dfrac{a}{ax+b}$ (13) $x^x(\ln x + 1)$

Problem E. Limits with trigonometric functions.

(1) $3/4$ (2) $1/3$ (3) 1 (4) $1/2$ (5) a/b

(6) $1/4$ (7) m/n (8) 0 (9) $2/3$ (10) 1

(11) $1/2$ (12) $\cos a$ (13) 2 (14) $1/3$ (15) -2

(16) -2 (17) $1/6$ (18) 2 (20) $\cos a$ (21) 0

Problem G. Limits with inverse trigonometric functions.

(1) $1/2$ (2) $-\sqrt{2}/2$ (3) $1/2$ (4) 0

(5) $2/3$