

PROBLEMS ON LIMITS

I.20 If  $x$  is a very large number then

$(x^2 + 3x + 12)/(2x^2 + 5x + 3)$  is (a) very large  
 (b) very small (c) near 1 (d) near  $1/2$  (e) near 4

II.10 If  $x$  is a very small positive number then

$(x + 1/x - 1)/(x + 2/x - 3)$  is (a) very small (b) very large  
 (c) near 1 (d) near  $1/2$  (e) near  $1/3$

III.2 If  $x$  is a negative number, but the absolute value  $|x|$

is very large, then  $(x - 1/x + 2)/(3 + x)$  is (a) very large  
 (b) very small (c) near 0 (d) near 1 (e) near  $2/3$

IV.4 If  $x$  is positive and very large then

$(3 - x + 5x^2)/(6 + 7x - 8x^3)$  is (a) near  $1/2$  (b) near  $-5/8$   
 (c) negative and near 0 (d) positive and near 0  
 (e) very large .

V.5 If  $x$  is a negative number near 0,  $P(x) = 3/x + 6/x^2 -$

$20/x^3$  and  $Q(x) = 1/x - 3/x^2 + 5/x^3$  then  $P(x)/Q(x)$  is  
 (a) negative and large in magnitude (b) near 0  
 (c) near -3 (d) near 2 (e) near -4

VI.2 If  $r$  is a negative number which is very close to 0 then

the ratio  $(1 - r + r^2)/5r$  is (a) negative and large in magnitude  
 (b) positive and near 0 (c) negative and near 0  
 (d) near  $1/5$  (e) near  $-1/5$  .

VII.4 Given that  $x$  is a small positive number and  $y$  is a large (in magnitude) negative number then

$(1/x + y - 5)/(2/x - 4y + 2)$  is (a) near  $1/2$  (b) near  $1/4$   
 (c) near  $-5/2$  (d) near  $-1/4$  (e) cannot tell from the given information.

VIII.8 If  $x$  is a very small positive number then

$(5/x + 3)/(x^2 + 7x - 2/x)$  is (a) a very large positive number  
 (b) near 0 (c) near  $-5/2$  (d) a very large negative number  
 (e) none of (a), (b), (c), (d)

X.19 If  $n$  is very large then  $(8^n + 7^n + 6^n)/(9^n - 8^n - 7^n)$  is

(a) near 0 (b) near 1 (c) between 2 and 10 (d) a very large number  
 (e) none of (a)-(d)