

Note: Please Read

For the upcoming quiz section test, there will be several questions where you will be asked to do calculations such as the ones that we did in class, and in the following practice problems. You may wish to bring a calculator with you on the day of the test. For all calculation problems, you should SHOW YOUR WORK and you will receive full credit if you set the problem up correctly.

We will complete the short answer (timed portion) of the test first, and then you can work on the calculations portion of the test at your own pace.

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#1

A patient with type 1 diabetes was evaluated at his yearly physical, and the following measurements were obtained:

plasma concentration of glucose:	200 mg/dL
urine concentration of glucose:	10 mg/ml
urine flow rate:	1728 ml in 24 hr
urine concentration of protein:	200 mg in 24 hr
inulin clearance:	90 ml/min
creatinine clearance:	105 ml/min

- a) What is the plasma concentration of glucose in mg/ml?
- b) What is the urine flow rate in ml/min?
- c) Determine the filtered load of glucose (in mg/min).
- d) Determine how much glucose was excreted (in mg/min).
- e) Determine how much glucose was reabsorbed or secreted (in mg/min).

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#2

amount of inulin excreted in urine:	15 mg/min
urine concentration of inulin:	15 mg/ml
plasma concentration of inulin:	0.2 mg/ml
creatinine clearance:	85 ml/min

Using the above information, calculate the GFR.

#3

The following measures were made from a patient.

glomerular filtration rate:	120 ml/min
urea excreted in urine:	15.0 mg/min
urine flow rate:	1.5 ml/min
urine concentration of urea:	10.0 mg/ml
plasma concentration of urea:	0.2 mg/ml
urine concentration of inulin:	8 mg/ml
plasma concentration of inulin:	0.1 mg/ml

a) Determine the renal clearance of urea.

b) Determine the filtered load of urea.

c) Is urea reabsorbed or secreted?

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#4

urea clearance:	75 ml/min
plasma concentration of inulin:	0.25 mg/ml
urine concentration of inulin:	20 mg/ml
urine flow rate:	1.25 ml/min
urine concentration of creatinine:	0.8 mg/ml
plasma concentration of creatinine:	0.009 mg/ml

Use the above information to determine creatinine clearance.

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#5

urine flow rate:	0.9 ml/min
plasma concentration of creatinine:	0.6 mg/dL
urine concentration of creatinine:	0.7 mg/ml
GFR:	90 ml/min

a) Convert plasma concentration of creatinine to mg/ml.

b) Use the above information to determine creatinine clearance.

c) Calculate the filtered load of creatinine (in mg/ml).

d) Calculate the amount of creatinine that was either reabsorbed or secreted (in mg/ml).