1a)

$R1 = \sigma_{dept='CS'}(professor)$

$R2 = \pi_{pnum,\ lastname}(R1 \bowtie_{pnum} (section \bowtie_{pnum} (\sigma_{cnum\ 'CS348'\ \wedge grade<60} (enrollment))))$

1b)

$R1 = \sigma_{dept='CS'}(professor)$

$R2 = \pi_{pnum,\ lastname}(R1 - (\pi_{pnum,\ lastname} (\sigma_{cnum='CS348' \vee cnum='CS234'} (professor \bowtie_{pnum} section \bowtie_{pnum} (enrollment)))))$

1c)

$R1 = \pi_{\ snum,\ firstname,\ year} (\sigma_{\ year=4} (student))$

$R2 = \pi_{\ snum,\ cnum,\ grade} (\sigma_{\ cnum\ starts\ with\ 'C'} (enrollment \bowtie_{snum} section))$

$R3 = \pi_{snum}(\sigma_{grade>=90}(R2))$

$R4 = R1 - R3$

$R5 = \pi_{\ snum,\ firstname,\ year}(R4)$