Practice Session: Lab Work

1. For the following CBC results, calculate the ANC and the I/T ratio.
2. Plot the ANC on the Schmutz charts provided with each CBC example.
3. For each CBC, is the platelet count low, normal or high?

ANC Calculation

WBC (may be reported as WBC x 10^3/μL) multiplied by [(%) (segs + bands + metas)]

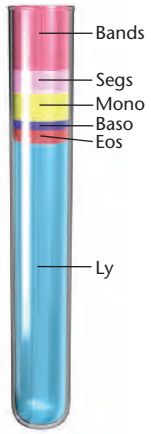
Immature to Total (I/T) ratio calculation

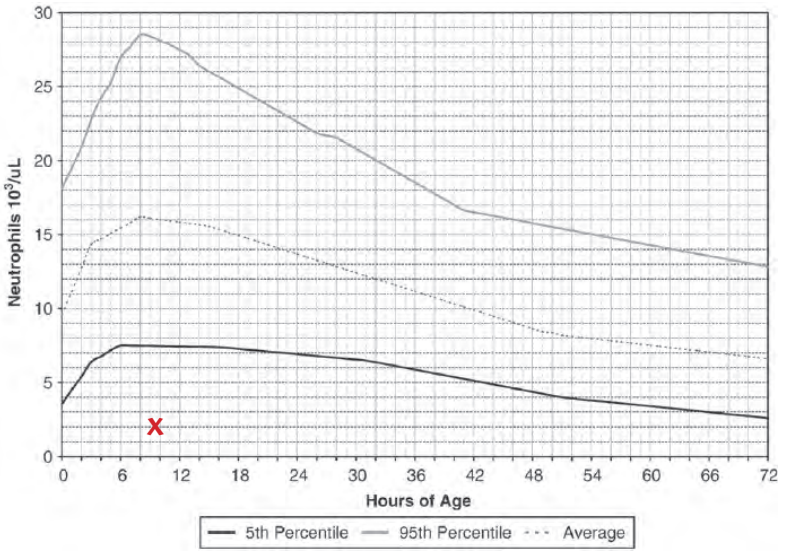
(%) metamyelocytes + bands **(Immature)** divided by (%) metamyelocytes + bands + segs **(Total)**

CBC 1

Age 8 hours
39 weeks gestation

WBC (mm^3)	10.4
Metamyelocytes (%)	0
Band Neutrophils (%)	14
Segmented Neutrophils (%)	5
Monocytes (%)	6
Basophils (%)	2
Eosinophils (%)	3
Lymphocytes (%)	70
Platelets	141,000





ANC calculation

The ANC is 1976 (plot on the appropriate chart for gestational age for the patient's age)

10,400 x 19% or .19 = 1976

I/T ratio calculation

$$\frac{0 \text{ metas} + 14 \text{ bands} = \text{Immature}}{0 \text{ metas} + 14 \text{ bands} + 5 \text{ segs} = \text{Total}}$$

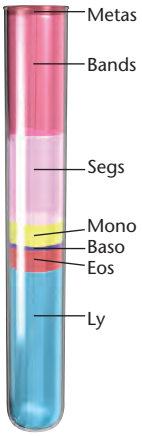
$$\frac{14}{19} = 0.74 \quad \text{The I/T ratio is } 0.74$$

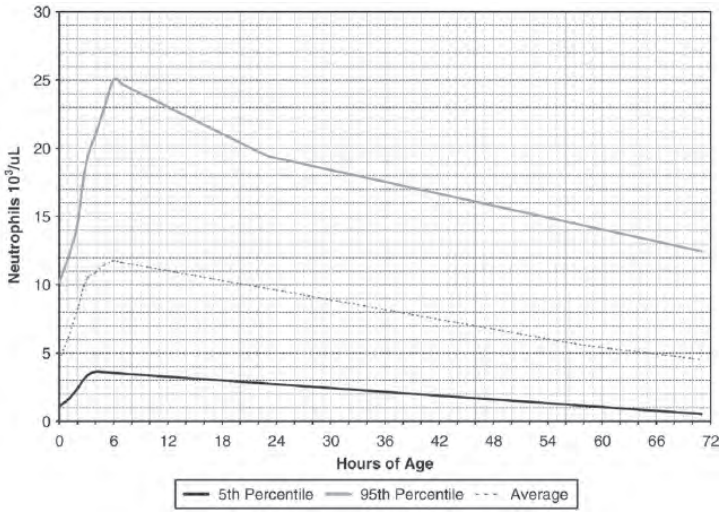
For the I/T and ANC calculations, disregard the lymphocyte, monocyte, eosinophil, and basophil percentages, but do include any metamyelocytes or myelocytes as immature cells if present on the CBC report.

CBC 2

Age 24 hours
34 weeks gestation

WBC (mm³)	15.6
Metamyelocytes (%)	2
Band Neutrophils (%)	26
Segmented Neutrophils (%)	20
Monocytes (%)	5
Basophils (%)	1
Eosinophils (%)	5
Lymphocytes (%)	41
Platelets	107,000





ANC calculation

15,600 x ____ (%) neutrophils = ____ (ANC)

I/T ratio calculation

____ metas + ____ bands = Immature

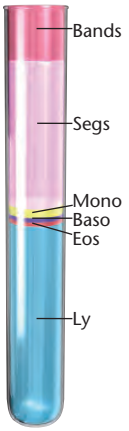
____ metas + ____ bands + ____ segs = Total

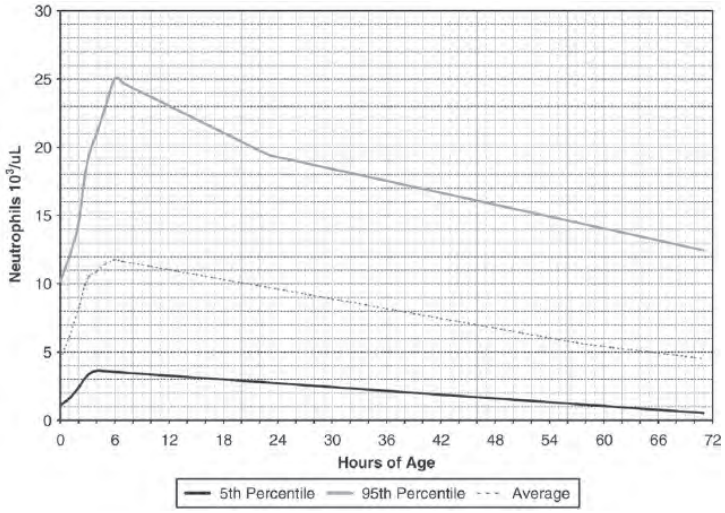
____ / ____ = ____ The I/T ratio is ____

CBC 3

Age 18 hours
30 weeks gestation

WBC (mm³)	15.4
Metamyelocytes (%)	0
Band Neutrophils (%)	12
Segmented Neutrophils (%)	33
Monocytes (%)	2
Basophils (%)	1
Eosinophils (%)	1
Lymphocytes (%)	51
Platelets	171,000





ANC calculation

____ x ____ (%) neutrophils = ____ (ANC)

I/T ratio calculation

____ metas + ____ bands = Immature

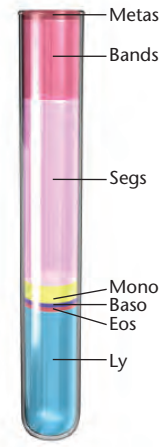
____ metas + ____ bands + ____ segs = Total

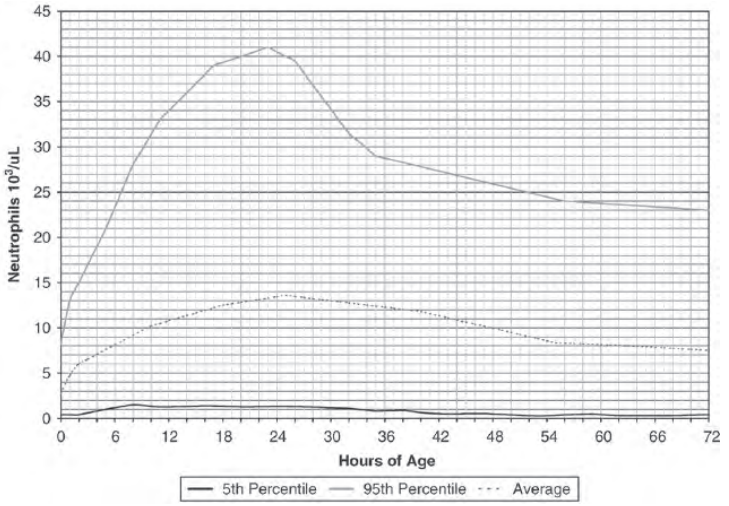
____ / ____ = ____ The I/T ratio is ____

CBC 4

Age 4 hours
26 weeks gestation

WBC (mm³)	1.3
Metamyelocytes (%)	2
Band Neutrophils (%)	17
Segmented Neutrophils (%)	42
Monocytes (%)	4
Basophils (%)	1
Eosinophils (%)	1
Lymphocytes (%)	33
Platelets	226,000





ANC calculation

[ ] x [ ] (%) neutrophils = [ ] (ANC)

I/T ratio calculation

[ ] metas + [ ] bands = Immature

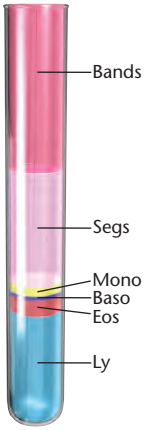
[ ] metas + [ ] bands + [ ] segs = Total

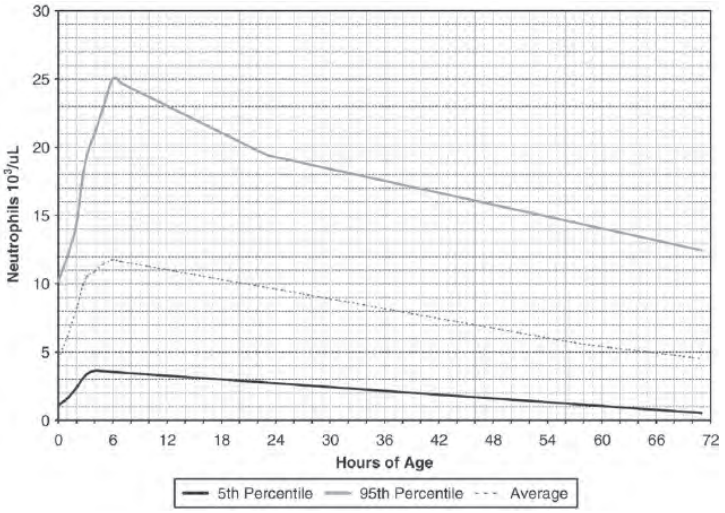
[ ] / [ ] = [ ] The I/T ratio is [ ]

CBC 5

Age 10 hours
36 weeks gestation

WBC (mm³)	3.1
Metamyelocytes (%)	0
Band Neutrophils (%)	37
Segmented Neutrophils (%)	27
Monocytes (%)	2
Basophils (%)	1
Eosinophils (%)	4
Lymphocytes (%)	29
Platelets	72,000





ANC calculation

[ ] x [ ] (%) neutrophils = [ ] (ANC)

I/T ratio calculation

[ ] metas + [ ] bands = Immature

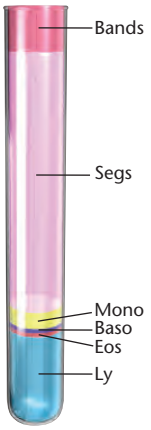
[ ] metas + [ ] bands + [ ] segs = Total

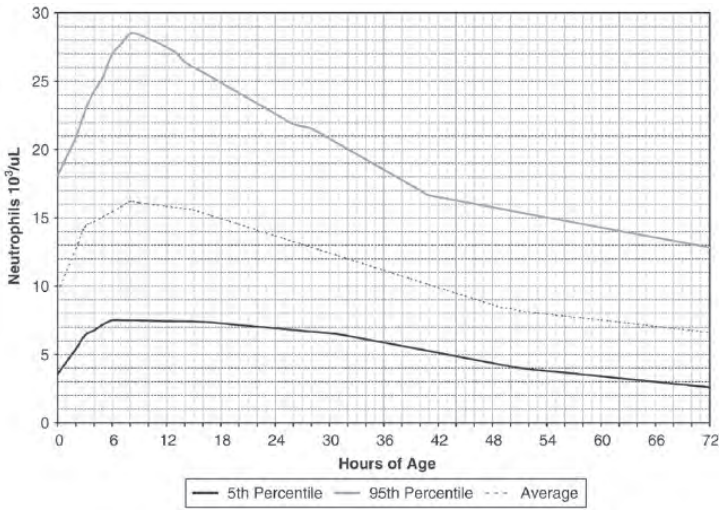
[ ] / [ ] = [ ] The I/T ratio is [ ]

CBC 6

Age 36 hours
38 weeks gestation

WBC (mm³)	26.5
Metamyelocytes (%)	0
Band Neutrophils (%)	10
Segmented Neutrophils (%)	60
Monocytes (%)	4
Basophils (%)	1
Eosinophils (%)	1
Lymphocytes (%)	24
Platelets	280,000





ANC calculation

[ ] x [ ] (%) neutrophils = [ ] (ANC)

I/T ratio calculation

[ ] metas + [ ] bands = Immature

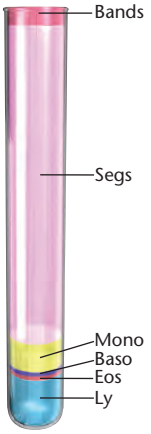
[ ] metas + [ ] bands + [ ] segs = Total

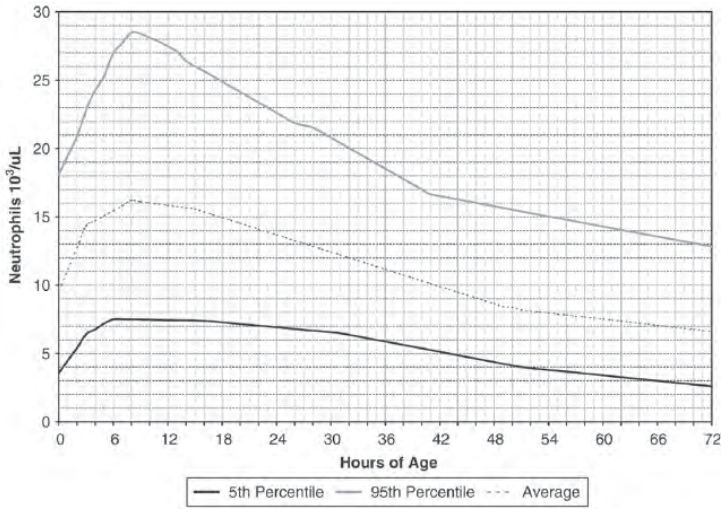
[ ] / [ ] = [ ] The I/T ratio is [ ]

CBC 7

Age 60 hours – same patient as CBC 6 – **24 hours later**

WBC (mm³)	10.4
Metamyelocytes (%)	0
Band Neutrophils (%)	4
Segmented Neutrophils (%)	73
Monocytes (%)	7
Basophils (%)	1
Eosinophils (%)	1
Lymphocytes (%)	14
Platelets	240,000





ANC calculation

[ ] x [ ] (%) neutrophils = [ ] (ANC)

I/T ratio calculation

[ ] metas + [ ] bands = Immature

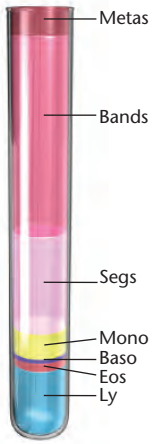
[ ] metas + [ ] bands + [ ] segs = Total

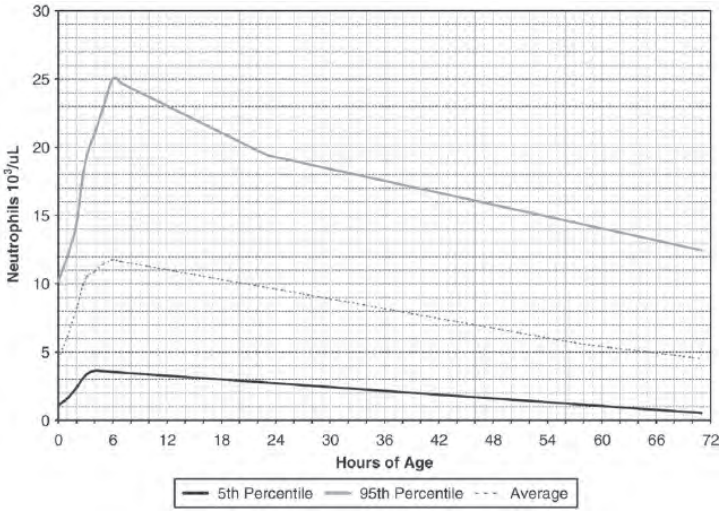
[ ] / [ ] = [ ] The I/T ratio is [ ]

CBC 8

Age 48 hours
30 weeks gestation

WBC (mm³)	6.3
Metamyelocytes (%)	6
Band Neutrophils (%)	44
Segmented Neutrophils (%)	23
Monocytes (%)	6
Basophils (%)	1
Eosinophils (%)	2
Lymphocytes (%)	18
Platelets	95,000





ANC calculation

[ ] x [ ] (%) neutrophils = [ ] (ANC)

I/T ratio calculation

[ ] metas + [ ] bands = Immature

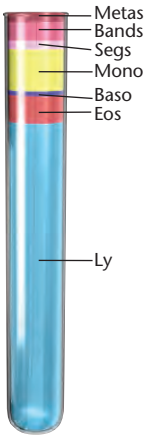
[ ] metas + [ ] bands + [ ] segs = Total

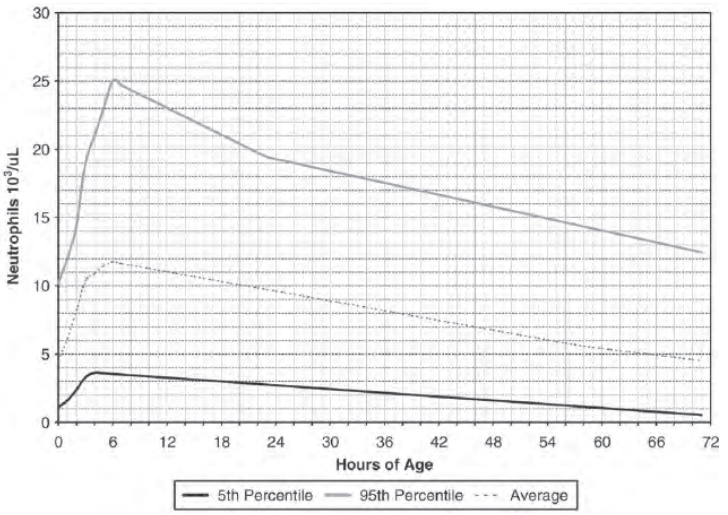
[ ] / [ ] = [ ] The I/T ratio is [ ]

CBC 9

Age 60 hours – same patient as CBC 8, **12 hours later**

WBC (mm³)	0.8
Metamyelocytes (%)	2
Band Neutrophils (%)	4
Segmented Neutrophils (%)	2
Monocytes (%)	9
Basophils (%)	1
Eosinophils (%)	6
Lymphocytes (%)	76
Platelets	24,000





ANC calculation

[ ] x [ ] (%) neutrophils = [ ] (ANC)

I/T ratio calculation

[ ] metas + [ ] bands = Immature

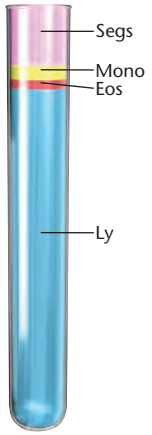
[ ] metas + [ ] bands + [ ] segs = Total

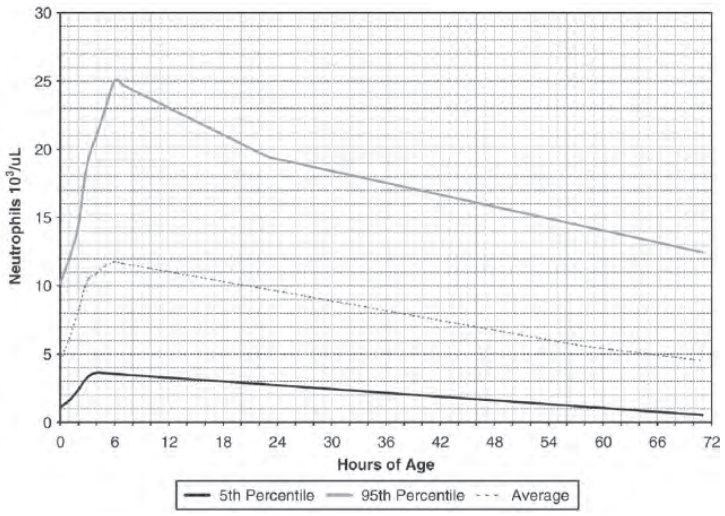
[ ] / [ ] = [ ] The I/T ratio is [ ]

CBC 10

Age 12 hours
35 weeks gestation

WBC (mm^3)	1.1
Metamyelocytes (%)	0
Band Neutrophils (%)	0
Segmented Neutrophils (%)	13
Monocytes (%)	3
Basophils (%)	0
Eosinophils (%)	2
Lymphocytes (%)	82
Platelets	46,000





ANC calculation

[ ] x [ ] (%) neutrophils = [ ] (ANC)

I/T ratio calculation

[ ] metas + [ ] bands = Immature

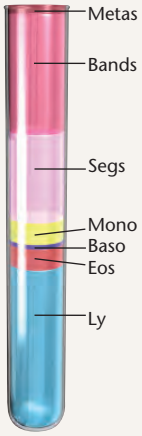
[ ] metas + [ ] bands + [ ] segs = Total

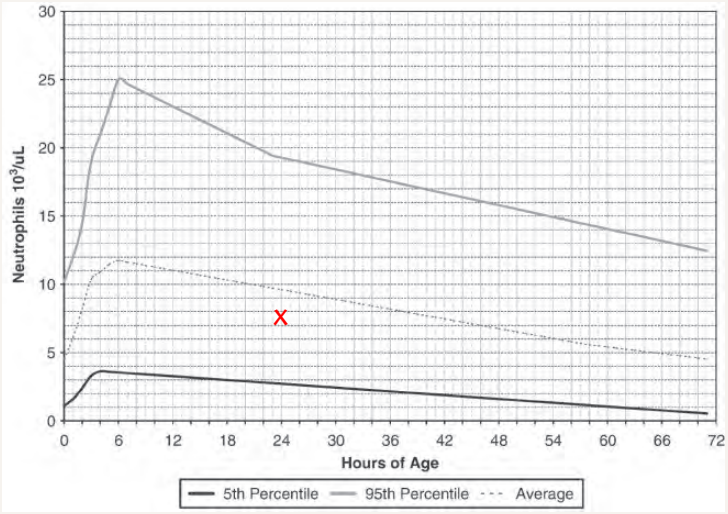
[ ] / [ ] = [ ] The I/T ratio is [ ]

CBC 2

Age 24 hours
34 weeks gestation

WBC (mm³)	15.6
Metamyelocytes (%)	2
Band Neutrophils (%)	26
Segmented Neutrophils (%)	20
Monocytes (%)	5
Basophils (%)	1
Eosinophils (%)	5
Lymphocytes (%)	41
Platelets	107,000





ANC calculation

15,600 x *48* (%) neutrophils = *7488* (ANC)

I/T ratio calculation

2 metas + *26* bands = Immature

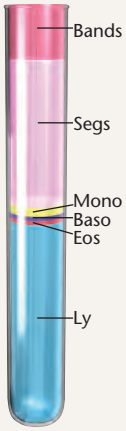
2 metas + *26* bands + *20* segs = Total

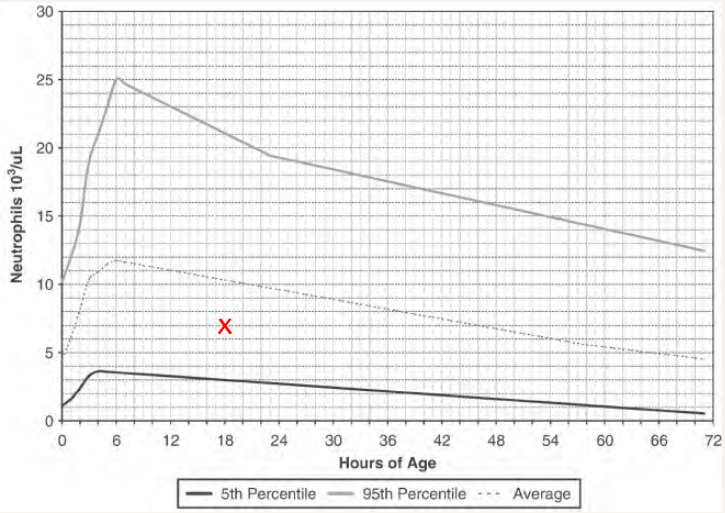
28 / *48* = *.58* The I/T ratio is *.58*

CBC 3

Age 18 hours
30 weeks gestation

WBC (mm³)	15.4
Metamyelocytes (%)	0
Band Neutrophils (%)	12
Segmented Neutrophils (%)	33
Monocytes (%)	2
Basophils (%)	1
Eosinophils (%)	1
Lymphocytes (%)	51
Platelets	171,000





ANC calculation

15,400 x *45* (%) neutrophils = *6930* (ANC)

I/T ratio calculation

0 metas + *12* bands = Immature

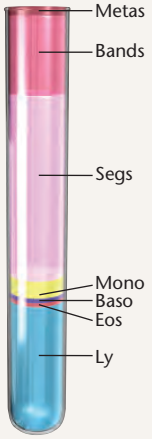
0 metas + *12* bands + *33* segs = Total

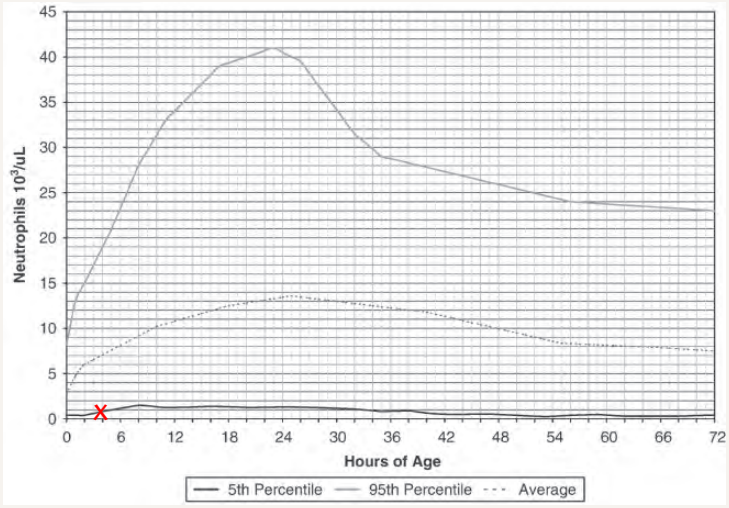
12 / *45* = *.27* The I/T ratio is *.27*

CBC 4

Age 4 hours
26 weeks gestation

WBC (mm³)	1.3
Metamyelocytes (%)	2
Band Neutrophils (%)	17
Segmented Neutrophils (%)	42
Monocytes (%)	4
Basophils (%)	1
Eosinophils (%)	1
Lymphocytes (%)	33
Platelets	226,000





ANC calculation

1,300 x 61 (%) neutrophils = 793 (ANC)

I/T ratio calculation

2 metas + 17 bands = Immature

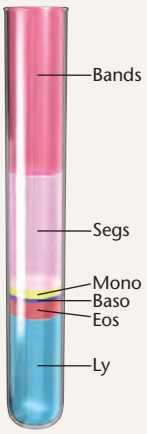
2 metas + 17 bands + 42 segs = Total

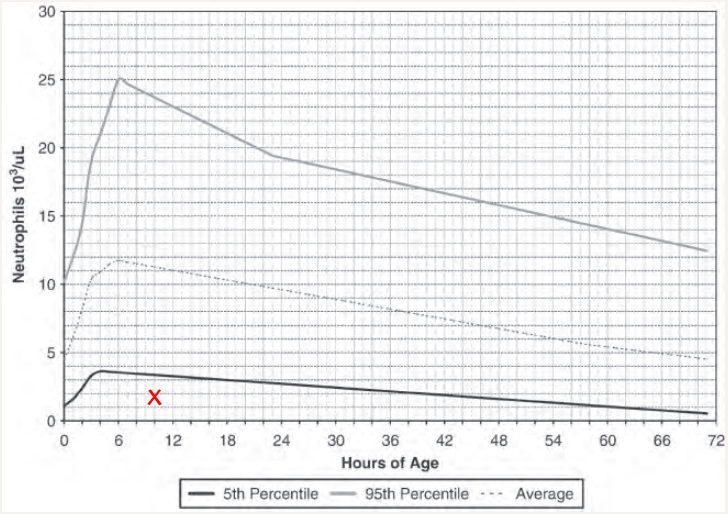
19 / 61 = .31 The I/T ratio is .31

CBC 5

Age 10 hours
36 weeks gestation

WBC (mm³)	3.1
Metamyelocytes (%)	0
Band Neutrophils (%)	37
Segmented Neutrophils (%)	27
Monocytes (%)	2
Basophils (%)	1
Eosinophils (%)	4
Lymphocytes (%)	29
Platelets	72,000





ANC calculation

3,100 x 64 (%) neutrophils = 1984 (ANC)

I/T ratio calculation

0 metas + 37 bands = Immature

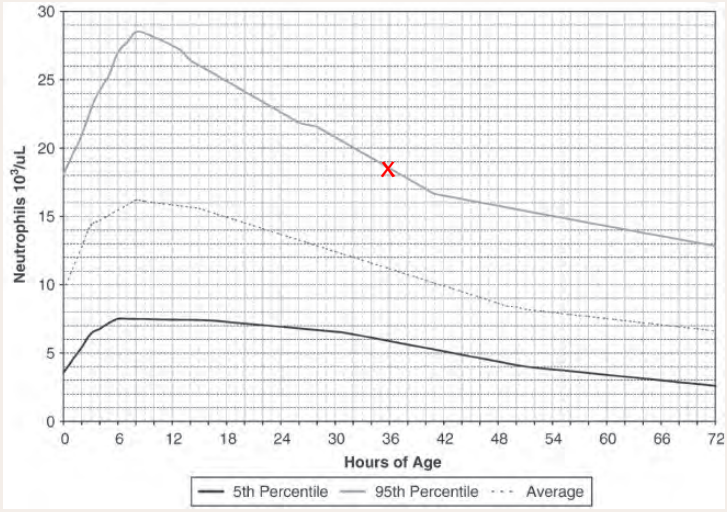
0 metas + 37 bands + 27 segs = Total

37 / 64 = .58 The I/T ratio is .58

CBC 6

Age 36 hours
38 weeks gestation

WBC (mm³)	26.5
Metamyelocytes (%)	0
Band Neutrophils (%)	10
Segmented Neutrophils (%)	60
Monocytes (%)	4
Basophils (%)	1
Eosinophils (%)	1
Lymphocytes (%)	24
Platelets	280,000



ANC calculation

26,500 x 70 (%) neutrophils = 18,550 (ANC)

I/T ratio calculation

0 metas + 10 bands = Immature

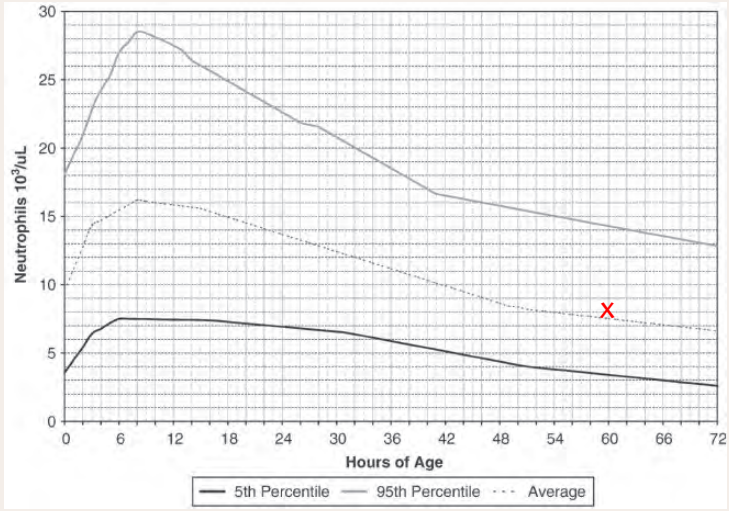
0 metas + 10 bands + 60 segs = Total

10 / 70 = .14 The I/T ratio is .14

CBC 7

Age 60 hours – same patient as CBC 6 – **24 hours later**

WBC (mm³)	10.4
Metamyelocytes (%)	0
Band Neutrophils (%)	4
Segmented Neutrophils (%)	73
Monocytes (%)	7
Basophils (%)	1
Eosinophils (%)	1
Lymphocytes (%)	14
Platelets	240,000



ANC calculation

10,400 x 77 (%) neutrophils = 8,008 (ANC)

I/T ratio calculation

0 metas + 4 bands = Immature

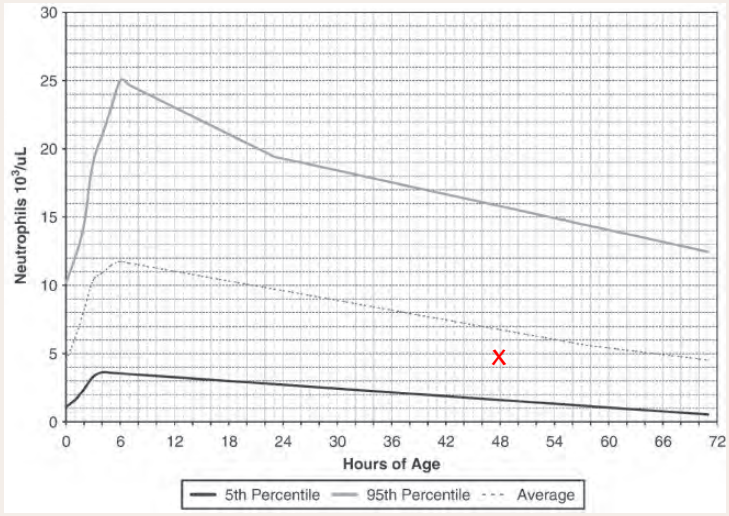
0 metas + 4 bands + 73 segs = Total

4 / 77 = .05 The I/T ratio is .05

CBC 8

Age 48 hours
30 weeks gestation

WBC (mm³)	6.3
Metamyelocytes (%)	6
Band Neutrophils (%)	44
Segmented Neutrophils (%)	23
Monocytes (%)	6
Basophils (%)	1
Eosinophils (%)	2
Lymphocytes (%)	18
Platelets	95,000



ANC calculation

6,300 x 73 (%) neutrophils = 4599 (ANC)

I/T ratio calculation

6 metas + 44 bands = Immature

6 metas + 44 bands + 23 segs = Total

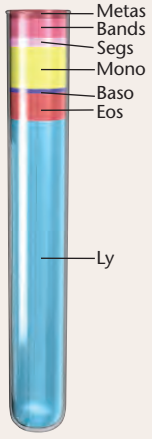
50 / 73 = .68 The I/T ratio is .68

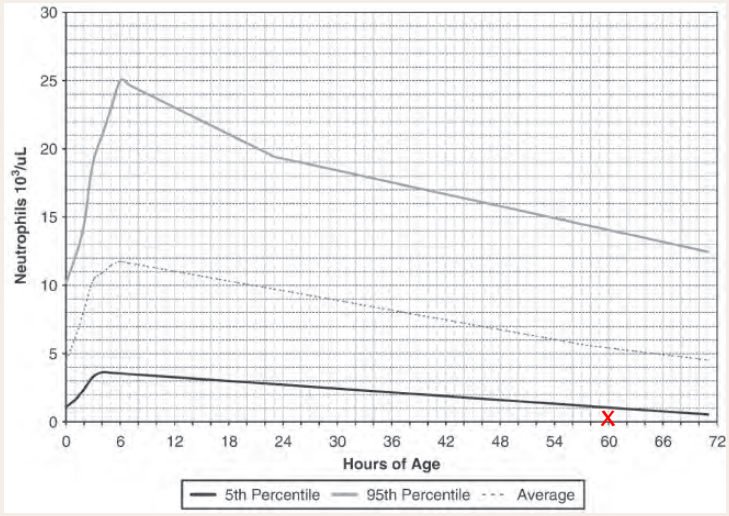
272

CBC 9

Age 60 hours – same patient as CBC 8, **12 hours later**

WBC (mm³)	0.8
Metamyelocytes (%)	2
Band Neutrophils (%)	4
Segmented Neutrophils (%)	2
Monocytes (%)	9
Basophils (%)	1
Eosinophils (%)	6
Lymphocytes (%)	76
Platelets	24,000





ANC calculation

800 x 8 (%) neutrophils = 64 (ANC)

I/T ratio calculation

2 metas + 4 bands = Immature

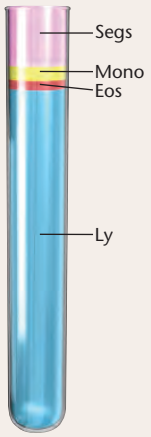
2 metas + 4 bands + 2 segs = Total

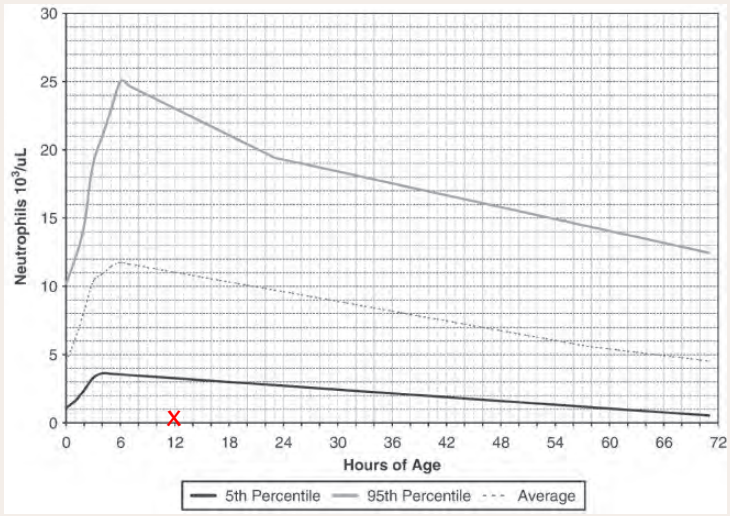
6 / 8 = .75 The I/T ratio is .75

CBC 10

Age 12 hours
35 weeks gestation

WBC (mm^3)	1.1
Metamyelocytes (%)	0
Band Neutrophils (%)	0
Segmented Neutrophils (%)	13
Monocytes (%)	3
Basophils (%)	0
Eosinophils (%)	2
Lymphocytes (%)	82
Platelets	46,000





ANC calculation

1,100 x *13* (%) neutrophils = *143* (ANC)

I/T ratio calculation

0 metas + *0* bands = Immature

0 metas + *0* bands + *13* segs = Total

$\frac{0}{13}$ = *0* The I/T ratio is *0*