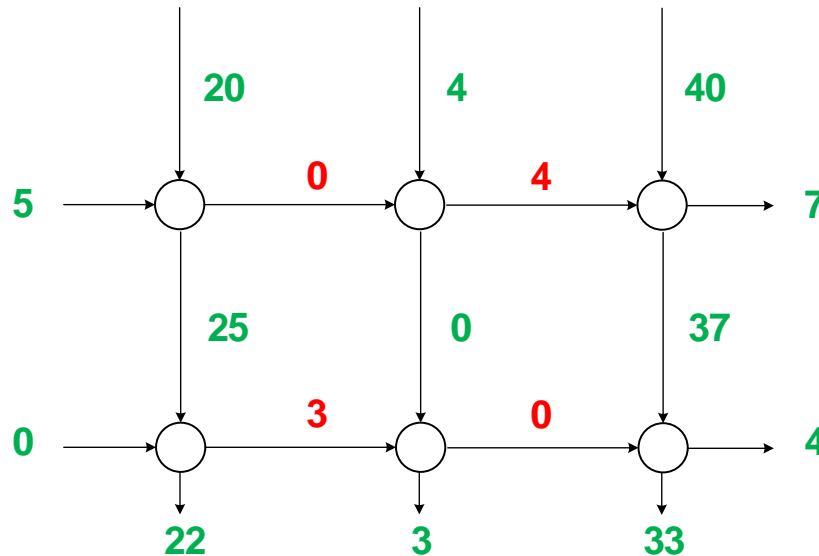


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8. Second material: infer all flows from given data



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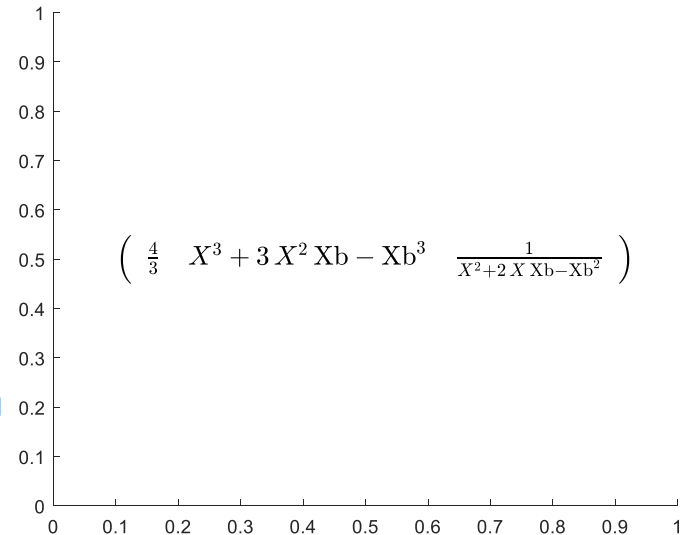
12. $x = 3, y = 3, M = 100,000, N = 3600, A = 10, D^* = 4,$
 $L = 6710, TA = 410,652$
13. $M = 210, D^* = 6, L_{ded} = 18, TD_{ded} = 3090, L_{rand} =$
 $11, TD_{rand} = 3630$
14. $M = 50,000, D^* = 3, L = 4,195, TA = 163,605, TA =$
 $188,146, d_{SC} = 613.43, t_{SC} = 2.00$

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15.

```
syms X Xb
Xbp = X - Xb
dB = X*8/3 + Xb*4/3
TMab = X^2*(2*X)
TAb = Xbp^2/2
TMb = TAb*dB
TAa = X^2 - Xbp^2/2
dA = simplify(factor((TMab - TMb)/TAa))
pretty(dA)
text(.1,.5,['$$' latex(dA) '$$'],...
      'Interpreter','latex','fontsize',14)
```

```
Xbp =
X - Xb
dB =
(8*X)/3 + (4*Xb)/3
TMab =
2*X^3
TAb =
(X - Xb)^2/2
TMb =
((X - Xb)^2*((8*X)/3 + (4*Xb)/3))/2
TAa =
X^2 - (X - Xb)^2/2
dA =
[ 4/3, X^3 + 3*X^2*Xb - Xb^3, 1/(X^2 + 2*X*Xb - Xb^2) ]
/ 4      3      2      3      1      \
| -, X  + 3 X  Xb - Xb , ----- |
| 3      2      2      2      |
\      X  + 2 X Xb - Xb  /
```



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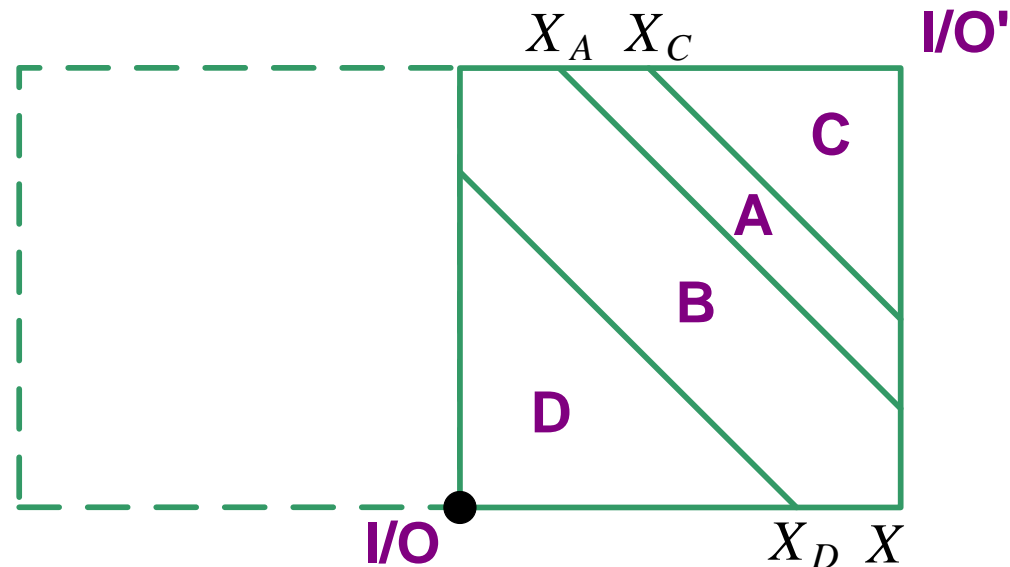
16. $X = \sqrt{TA/2} = 31.62$

$$X_D = \sqrt{2(TA_D / 2)} = 24.49$$

$$X'_C = \sqrt{TA_C} = 17.32 \Rightarrow X_C = X - X'_C$$

$$X'_A = \sqrt{TA_A + TA_C} = 24.49 \Rightarrow X_A = X - X'_A$$

$$TA_B = TA - (TA_D + TA_C + TA_A)$$



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17.

```

%% Data
fn = 'ItemOrderData.xlsx';
IM = readtable(fn,'Sheet','ItemMaster')
O = readtable(fn,'Sheet','Order1')


---


%% Join Tables
OIM = join(O,IM)
sumtotal = @(idx,val) arrayfun(@(x) sum(val(x==idx)),unique(idx));


---


%% WH Design Parameters
p.TotalLines = size(O,1);
p.LinesPerOrder = p.TotalLines/length(unique(O.ORDER));
p.CubePerOrder = mean(sumtotal(OIM.ORDER,OIM.QTY.*OIM.CUBE));
p.FlowPerItem = sumtotal(OIM.SKU,OIM.QTY)';
p.LinesPerItem = sumtotal(OIM.SKU,ones(size(OIM.SKU)))';
p.CubeMovement = sumtotal(OIM.SKU,OIM.QTY.*OIM.CUBE)';

```

OIM =
10x9 [table](#)

ORDER	SKU	QTY	UOM	LENGTH	WIDTH	DEPTH	CUBE	WEIGHT
1	1	3	'EA'	5	3	4	60	7.45
1	2	4	'EA'	6	4	5	48	8.05
1	3	6	'EA'	8	6	5	180	12.5
2	1	12	'EA'	5	3	4	60	7.45
2	2	4	'EA'	6	4	5	48	8.05
2	3	12	'EA'	8	6	5	180	12.5
2	4	6	'EA'	4	4	3	32	9.75
3	1	6	'EA'	5	3	4	60	7.45
3	3	12	'EA'	8	6	5	180	12.5
3	4	12	'EA'	4	4	3	32	9.75

```

p =
struct with fields:
    TotalLines: 10
    LinesPerOrder: 3.3333
    CubePerOrder: 2540
    FlowPerItem: [21 8 30 18]
    LinesPerItem: [3 2 3 2]
    CubeMovement: [1260 384 5400 576]

```