

DAY 7 – More Substitution Method

For the following problems:

- Create let statements
- Create TWO equations
- Solve the System By Substitution Method
- Write therefore statement – answering the question

1. Malcolm is twice as old as Sundeeep. The sum of their ages is 39. 2. find the ages of the boys.

(a) let M be Malcolm's age
let U be Sundeeep's age

$$\textcircled{b} \quad M = 2U \quad \textcircled{1}$$

$$M + U = 39 \quad \textcircled{2}$$

(c) M is isolated in $\textcircled{1}$
sub in $\textcircled{2}$

$$2U + U = 39$$

$$3U = 39$$

$$U = 13$$

sub in $\textcircled{1}$

$$M = 2(13)$$

$$M = 26$$

(d) \therefore Malcolm is 26 yrs old
and Sundeeep is 13.

The cost of printing a magazine is based on a fixed set-up cost and the number of pages to be printed. One printing company charges a \$250 set-up fee and \$5/page, while a second company charges a \$400 set-up fee plus \$4/page. What does the point of intersection represent?

(a) let p be # of pages
let C be cost

$$\textcircled{b} \quad C = 250 + 5p$$

$$C = 400 + 4p$$

(c) C is isolated in $\textcircled{1}$, sub in $\textcircled{2}$

$$250 + 5p = 400 + 4p$$

$$5p - 4p = 400 - 250$$

$$p = 150$$

$$\text{sub in } \textcircled{1} \quad C = 250 + 5(150)$$

$$C = 250 + 750$$

$$C = 1000$$

(d) \therefore POI rep. that
for 150 pages both
companies charge 1000

Which company should Richard choose to print 175 pages?

$$\left. \begin{aligned} C &= 250 + 5(175) \\ &= 250 + 875 \\ &= 1125 \end{aligned} \right\} \left. \begin{aligned} C &= 400 + 4(175) \\ &= 400 + 700 \\ &= 1100 \end{aligned} \right.$$

\therefore Richard should choose
the 2nd company

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3. Eleni rents a car on two separate occasions. The first time, she pays \$180 for 3 days and 150 km. The next time, she pays \$180 for 2 days and 400 km.

a) let d be price per day
let k be price per km

b) $180 = 3d + 150k$ (1)
 $180 = 2d + 400k$

c) isolate d in (1)

$$\frac{180}{3} - \frac{150k}{3} = \frac{3d}{3}$$

$$60 - 50k = d$$

sub in (2)

$$180 = 2(60 - 50k) + 400k$$

$$180 = 120 - 100k + 400k$$

$$60 = 300k$$

$$0.20 = k$$

sub in (2)

$$180 = 2d + 400(0.2)$$

$$180 = 2d + 80$$

$$100 = 2d$$

$$50 = d$$

d) ∴ costs \$50 per day
and \$0.20 per km.

4. Logan's next fundraising event is dog grooming. A local dog groomer will charge a flat fee of \$120 plus \$8 per dog. Logan plans to charge customers \$16 per dog.



What is the minimum number of customers Logan needs to make money from this event?

a) let d be # of dogs
let C be cost

b) $C = 120 + 8d$
 $C = 16d$

c) C already isolated in (1)
sub in (2)

$$120 + 8d = 16d$$

$$120 = 8d$$

$$15 = d$$

sub in (1)

$$C = 120 + 8(15)$$

$$C = 120 + 120$$

$$C = 240$$

d) ∴ Logan needs more than 15 dogs in order to make money