



1. Simplify by collecting like terms.

a) $8y + 6x - 2y + 3x = 9x + 6y$
 b) $4y - 11 - 9y + 16 = -5y + 5$
 c) $m^2 - 4m - 5m^2 + 12 = -4m^2 - 4m + 12$

2. Expand (multiply) then simplify.

a) $7(c + 4) = 7c + 28$
 $-4(p^2 - 2p + 8) = -4p^2 + 8p - 32$
 $-3(x + 2) - 4x = -3x - 6 - 4x = -7x - 6$
 $5m(m - 9) = 5m^2 - 45m$
 $-3m^2 - 4m + 12 = -3m^2 - 4m + 12$

3. Simplify first. THEN evaluate if $x = -2$.

a) $5x + 2x + 1 = 7x + 1$
 $8 + 3x - 2x = 8 + x$
 $7(-2) + 1 = -14 + 1 = -13$
 b) $2x + 11 - 4(3x + 7) = 2x + 11 - 12x - 28 = -10x - 17$
 $-10(-2) - 17 = 20 - 17 = 3$
 c) $2x + 11 - 4(3x + 7) = 2x + 11 - 12x - 28 = -10x - 17$
 $-10(-2) - 17 = 20 - 17 = 3$
 d) $2x(x - 3) - (x + 1) = 2x^2 - 6x - x - 1 = 2x^2 - 7x - 1$
 $2(-2)^2 - 7(-2) - 1 = 2(4) + 14 - 1 = 21$

4. Solve for the unknown. YOU MUST SHOW STEPS.

a) $p - 3 = 10 \Rightarrow p = 10 + 3 = 13$
 $2 = 5 + k \Rightarrow k = 2 - 5 = -3$
 $2 - 5 = k \Rightarrow k = -3$
 $-3 = k \Rightarrow k = -3$
 b) $2 = 5 + k \Rightarrow k = -3$
 $6x = 42 \Rightarrow x = 7$
 $3x = 8 - 2 \Rightarrow 3x = 6 \Rightarrow x = 2$
 $5x(-2) = -10 \Rightarrow x = 2$

f) $7 - 4x = -5 \Rightarrow -4x = -5 - 7 = -12 \Rightarrow x = 3$
 $3x + 4x = 3x - 3 \Rightarrow 7x = 3x - 3 \Rightarrow 4x = -3 \Rightarrow x = -\frac{3}{4}$
 $7x = 3x - 3 \Rightarrow 4x = -3 \Rightarrow x = -\frac{3}{4}$
 $4x = -3 \Rightarrow x = -\frac{3}{4}$

5. Solve and check:
 $-40 = -4 + 4x \Rightarrow -40 + 4 = 4x \Rightarrow -36 = 4x \Rightarrow -9 = x$

h) $-7 - 3x = 8 + 2x \Rightarrow -3x - 2x = 8 + 7 \Rightarrow -5x = 15 \Rightarrow x = -3$

i) $2(x + 1) = 4(x - 2) \Rightarrow 2x + 2 = 4x - 8 \Rightarrow 2x - 4x = -8 - 2 \Rightarrow -2x = -10 \Rightarrow x = 5$



LS = -40
 RS = -4 + 4x
 $-40 = -4 + 4(-9) \Rightarrow -40 = -4 - 36 \Rightarrow -40 = -40$

LS = RS
 $x = -9$

6. Shirts Plus creates shirts with logos for teams. They charge an initial amount of \$40 for the design and then \$20 per shirt.

a) Complete the table of values for 0 to 50 shirts.

#shirts	Cost (\$)	(x, y)
0	40	(0, 40)
10	240	(10, 240)
20	440	(20, 440)
30	640	(30, 640)
40	840	(40, 840)
50	1040	(50, 1040)

b) Graph the relation on a piece of graph paper.

c) State the initial value. \$40

d) Determine the rate of change using your graph. **SHOW your work and UNITS!**

$ROC = \frac{rise}{run} = \frac{400}{20} = \20 per shirt

e) Write an equation for this relation. Define your variables.

$C = 40 + 20t$
 $C = \text{cost in dollars}$
 $t = \# \text{ t-shirts}$

f) Is this relationship linear or non-linear? How do you know?
 linear \rightarrow graph is straight line

g) Is this an example of direct or partial variation? How do you know?
 partial \rightarrow there is an initial value of \$40
 so the line doesn't pass through (0, 0).

h) Use your graph to determine how much it would cost for 35 shirts. SHOW YOUR WORK.

-see graph Cost = \$740 ∴ it costs \$740 for 35 shirts

i) Use your equation to determine the cost for 350 shirts. SHOW YOUR WORK.

$$C = 40 + 20(350)$$

$$= 40 + 7000$$

$$= 7040$$

∴ it costs \$7040 for 350 shirts

7. Monique has a job at a garden centre. She is paid \$~~10~~²⁰ per hour.

a) Write an equation to represent Monique's pay, P , after working h hours.

$$P = 20h$$

b) State the initial value for Monique's pay. \$0

c) Is this an example of direct or partial variation? How do you know?

Direct → initial value is 0

d) What is the rate of change for this relation? \$20 per hour

e) Create a table of values for 0 – 6 hours.

#hrs	Pay
0	0
1	20
2	40
3	60
4	80
5	100

f) Graph this relation on a piece of graph paper.

- see graph

8. Eric got a job with a starting bonus of \$20 plus \$15 per hour.

a) State the initial value for Eric's earnings. \$20

b) State the rate of change for Eric's earnings. \$15 per hour

c) Write an equation to represent Eric's earnings. Define your variables.

$$E = 20 + 15h \quad E = \text{Earnings } (\$) \quad h = \text{#hours}$$

d) Graph Eric's earnings on the same graph as Monique's (from qu. #7).

#hrs	Pay
0	20
1	35
2	50
3	65
4	80
5	95

e) State the point of intersection for the two lines: (4, 80)

f) What does the point of intersection mean based on this question?

When they work 4h they both get paid the same amount (\$80)

9. Examine this scatter plot to the right.



a) Should the line of best fit pass through the origin? Explain.

No - has to follow trend

b) Draw the line of best fit. Use your line of best fit to determine the distance after 3 seconds.

c) Describe this correlation by circling the appropriate word(s) **STRONG** **WEAK** **NEGATIVE** **NO** **POSITIVE**

10. Copy and complete each table. State whether the relation is linear or non-linear.

a)

x	y	First Difference
-1	4	$2 - 4 = -2$
0	2	$0 - 2 = -2$
1	0	$-2 - 0 = -2$
2	-2	

∴ linear b/c differences are same

b)

x	y	First Difference
-1	5	$9 - 5 = 4$
0	9	$12 - 9 = 3$
1	12	$14 - 12 = 2$
2	14	

∴ non linear b/c different not the same

Cost vs # Shirts Purchased

