

Algebraic Manipulation

1. Simplify:

a. $4a + 7a =$

b. $11b - 5 \cdot 5b =$

c. $\frac{c}{2} + 5 - 2c =$

d. $\frac{d}{2} + \frac{d}{4} - \frac{3d}{8} =$

e. $2 \cdot 5(6 - 4e) =$

f. $\frac{22 - 8f}{4} + 2f =$

2. Solve:

a. $4a + 7a = 121$

b. $11b - 5 \cdot 5b = 33$

c. $\frac{c}{2} + 5 - 2c = -8 \cdot 8$

d. $\frac{d}{2} + \frac{d}{4} - \frac{3d}{8} = 6$

e. $2 \cdot 5(6 - 4e) = 14 \cdot 8$

f. $\frac{22 - 8f}{4} + 2f = \frac{9f}{2}$

g. $110g = 240 - 80g$

h. $40 + h = 60 - h$

i. $12 + 3k = 18 - 6k$

j. $\frac{82 \cdot 3m + 323}{12 \cdot 2} = 11m - 6$

3. Rewrite the following in the form $y =$ something.

a. $y - 1 = 21$

b. $y - 4 = 21$

c. $y - 121 \cdot 7 = 21$

d. $y - x = 21$

e. $y - 6x = 21$

f. $y - 1 \cdot 1x - 18 \cdot 2 = 21$

g. $y + 1 = 21$

h. $y + 4 = 21$

i. $y + 121 \cdot 7 = 21$

j. $y + x = 21$

k. $y + 6x = 21$

l. $y + 5x - 11 = 21$

m. $y + 11x + 22 = 21$

4. Rewrite the following in the form $y =$ something.

a. $2y = 21$

b. $3y = 21$

c. $7y = 21$

d. $2y + 3 = 21$

e. $4y - 7 = 21$

f. $3y + 2x = 21$

g. $5y - x = 21$

l. $11(y + 6) + 3x = 21$

h. $4y + 16x + 1 = 21$

m. $7(y + x) = 21$

i. $3(y + 4) = 21$

n. $7(y + x + 1) = 21$

j. $7(y - 6) = 21$

o. $7(y + x) + 1 = 21$

k. $0.15(y - 92.2) + 18.1 = 21$

5. Rewrite the following in the form $y =$ something.

a. $\frac{y}{3} = 21$

e. $\frac{y}{4} - 2x = 21$

b. $\frac{y}{5} = 21$

f. $\frac{y - 2x}{4} = 21$

c. $\frac{y}{5} + 1 = 21$

g. $\frac{3y - 2x}{1.5} = 21$

d. $\frac{y + 1}{3} = 21$

h. $\frac{5y - 1.5x}{2.5} + 7.5 = 21$

6. Rewrite the following in the form $y =$ something.

a. $-y = 21$

e. $x - y = 21$

b. $1 - y = 21$

f. $7x - y = 21$

c. $6 - y = 21$

g. $5x - 7y = 21$

d. $36 - y = 21$

h. $5x - 7y + 11 = 21$

7. Make up eight more examples of your own similar to those above using addition, subtraction, multiplication and division, and using both x and y , then rewrite them in the form $y =$ something.

8. Rewrite the following in the form $y =$ something.

a. $4y = y + 21$

e. $58.4x + 16.2y = 11.7x - 19y$

b. $6y = 21 - y$

f. $\frac{12x - 24y}{5} = \frac{10x + 5y}{6}$

c. $9y + x = 21 + x$

g. $-4x - 9y - 21 = 3x - 8y - 21$

d. $1.5y - 0.5x = 21 + x$

9. Find a value for x and y that makes both 5e and 6e true at the same time. (Use your calculator to graph the two lines, and find where they intersect). Now repeat this for 5f and 6f, 5g and 6g, and 5h and 6h.
10. Rewrite the following situations as equations using x and y . If necessary, rearrange them so they are in the form $y = \dots$
- The cooking time for a roast is 25 minutes for each kilogram.
 - The cost of having curtains made is \$25 plus \$9.30 per metre of curtain.
 - The perimeter of an isosceles triangle is 21 cm
 - A rectangle has a perimeter of 38 m.
 - A car hire company has an initial charge of \$10 then charges \$1 per km for travel over 100 km.
 - A different company has an initial charge of \$20, then charges 24c per km for each km travelled.
11. How far do you have to travel before the car in question 10f is cheaper than that in 10e?