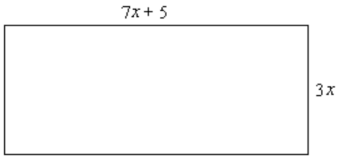
WORDED EQUATIONS

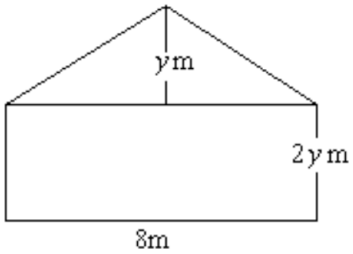
1. The ratio of the prices of two different sheets of glass is 2 : 5. The total bill for 20 sheets of the cheaper glass and 10 sheets of the more expensive one is \$1080. If d represents the cost of one sheet of the cheaper glass, determine
   (i) an expression in d for the cost of ONE sheet of the more expensive glass.
   (ii) the value of d
   (iii) the cost of ONE sheet of the more expensive glass.
2. Alice has t tapes and Ben has 10 tapes more than Alice
   (i) Express, in terms of t, the number of tapes Ben has.
   Alice gives Ben 14 of her tapes. Ben now has twice as many tapes as Alice now has.
   (ii) Write an algebraic equation to represent this new information.
   (iii) Calculate the value of t.
3. A farmer shared 496 tomatoes among her 3 workers, Paula, Greta and Gertrude. Greta received 16 more than Paula. Gertrude received three times as many as Paula. Calculate the number of tomatoes Paula received.
4. The width, w, of a rectangular lawn is 3 metres less than half its length, l. The perimeter is 42 metres.
   (i) Show that $w + l = 21$.
   (ii) Write an equation for the width, w, in terms of the length, l.
   (iii) Calculate, in metres, the width, w, of the lawn.
5. In a box there are n red balls and three times as many black balls.
   (i) Write an expression in n to represent the total number of balls in the box.
   Eight balls are removed from the box, there are 20 balls remaining.
   (ii) Write an equation to show this.
   (iii) Using your equation, calculate the number of black balls in the box at start.
6. A piece of rope 117 cm long is cut into two pieces so that one piece is 27 cm longer than the other. Calculate the length of the longer piece of rope.
7. 90 tickets were sold for a concert. x tickets were sold for \$3.00 each and the rest of the tickets for \$4.00 each.
   (a) Write an expression in x to represent the number of tickets sold at
      (i) \$3.00 each
      (ii) \$4.00 each
   (b) If the total sales on all tickets amounted to \$300.00, how many of the tickets costing \$3.00 was sold?
8. John is x years old and his sister Mary is $(5x - 12)$ years old. Given that Mary is twice as old as John, write in terms of x an equation connecting their ages and find their ages.

9. The diagram below shows a rectangle.



   The length of the rectangle is $7x + 5$ metres. The width of the rectangle is $3x$ metres.
   (i) If P stands for the perimeter of the rectangle, what expression in terms of x can be used for P?
   (ii) If A stands for the area of the rectangle, what expression in terms of x, can be used for A?
   It is known that the perimeter, P, is 90 metres.
   (iii) Using this information calculate the area, A, in square metres of the rectangle.
10. Barbara buys x CD's at \$6.00 each. She pays for them using a \$50 note and received y dollars in change. Express y in terms of x.

11. Alice runs at a rate of 170 metres in 1 minute and walks at a rate of 90 metres in 1 minute. From the instant she leaves home, Alice takes 6 minutes, by running and walking to reach a bus stop. Given that she runs for t minutes.,
    (i) Find, in terms of t, expressions for
        (a) the number of minutes she walks
        (b) the distance she runs
        (c) the distance to the bus stop
    (ii) Given also that the distance to the bus stop is 740 metres, find the value of t.
12. A man travelled a total distance of 8 km in 54 minutes by running and walking. He ran x km at 10 km/h and walked the remaining distance at 5 km/h.
    (i) Write an expression in x for the time, in hours, that
        (a) he ran
        (b) he walked
    (ii) Form an equation in x for the total time in hours spent travelling.
    (iii) Use the equation formed to:
        (a) calculate the value of x
        (b) Hence, calculate the distance the man walked.
13. The diagram below, not drawn to scale, shows the vertical cross section of a shed.



    (i) Write an expression in terms of y for the area of the figure shown.
    (ii) Calculate the value of y if the area of the figure is 28 m^2.
14. Adam, Imran and Shakeel were playing a card game.
    Adam scored x points.
    Imran scored 3 points fewer than Adam.
    Shakeel scored twice as many points as Imran
    Together they scored 39 points
    (i) Write down, in terms of x, an expression for the number of points scored by Shakeel.
    (ii) Write an equation which may be used to find the value of x.
15. An aircraft flew a distance of 3000 km from Berlin to Cairo at an average speed of v km/h.
    (a) Write down an expression for the time, in hours, that it took for the journey.
    The aircraft returned nonstop by the same route at an average speed of $2v$ km/h.
    (b) Write down an expression for the time, in hours, that it took for the return journey.
    (c) Given that the difference in these two times is 4 hours, form an equation in v and solve it.

ANSWERS

1. (i) $2.5d$ (ii) \$24 (iii) \$60
2. i) $t + 10$ ii) $t + 24 = 2(t - 14)$ iii) 52
3. 96
4. i) $P = 4l - 6$ (ii) $4l - 6 = 42$ (iii) 9 m
5. i) $4n$ (ii) $4n - 8 = 20$ (iii) 21
6. 72
7. i) x ii) $90 - x$ iii) 60
8. $5x - 12 = 2x$; John is 4 and Mary is 8
9. i) $P = 20x + 10$ ii) $A = 21x^2 + 15x$ iii) $A = 396\ m^2$
10. $y = 50 - 6x$
11. i) a) $6 - t$ b) $170t$ c) $80t + 540$ ii) 2.5 m
12. i) a) $\frac{x}{10}$ b) $\frac{8 - x}{5}$ ii) $\frac{x}{10} + \frac{8 - x}{5} = \frac{54}{60}$ iii) a) 7 km b) 1 km
13. i) $20y$ ii) 1.4
14. i) $2(x - 3)$ ii) 12
15. i) $\frac{3000}{v}$ b) $\frac{1500}{v}$ c) 375 km/h