Worksheet: Simplifying Algebraic Expressions, Linear and Simultaneous Equations, Factorization

1. Simplify:

(a) (i) $-4n + 3(2n - 5)$.

(ii) $\frac{4}{2x} - \frac{5}{x-3}$.

2. Solve:

$-3(5 - 2x) + 7 = 4x$

3. Factorize:

(a) $18a^2b + 24ab^2$.
(b) $49n^2 - 1$
(c) $3p^2 + 2p - 5$
(d) $16xz - 3wy - 8wx + 6yz$

4. The width of the floor is 3 metres less than its length. The length of the floor is x metres and its area is 40 m^2.
   (i) Write an expression for the width of the garden;
   (ii) Express the area of the garden in terms of x.
   (iii) Hence find the dimensions of the garden.

5. Solve the simultaneous equations:

$x + 5y = 9$

$2x - 3y = -8$

6. A rope of length 1.08 m is cut into three pieces. The length of the first piece is x cm. The second piece is 5 cm shorter than the first piece. The third piece is three times as long as the first piece.
   (i) Write an algebraic expressions, in terms of x, for the length of each of the three pieces:
   (ii) Write an equation for the sum of the three pieces;
   Sum of three pieces;
   (iii) Hence solve the equation to find the length (in cm) of each of the three pieces of rope.

7. The cost of 5 apples and 4 pears is $16, while the cost of three apples and 10 pears is $21.
   (a) If x represent the cost of an apple, and y represent the cost of a pear, write down two equations in x and y to represent the above information.
   (b) Find the cost of :
      (i) an apple;
      (ii) a pear.

