Worksheet 1-Paper 1

1. Simplify $x(x+4)+3x(2x-3)$
2. Expand and simplify
   (i) $(3x-1)(2x+5)$
   (ii) $(x-y)^2$
   (iii) $(3x-2)(2x^2-4x+2)$
3. Simplify
   (i) $\frac{3x+6}{3}$
   (ii) $\frac{3x^2-6x}{3x}$
   (iii) $\frac{15yx^2-10xy^2}{5xy}$
   (iv) $\frac{2x^2+5x-3}{2x-1}$
4. Divide
   (i) $(x^3-22x+15)\ by\ (x+5)$
   (ii) $(x^3-8)\ by\ (x-2)$
5. If $f(x)=x^2-3x+6$ find;
   (i) $f(0)$
   (ii) $f(-5)$
   (iii) $f(-\frac{1}{2})$
6. Using the formula $T=2\pi\left(\sqrt{\frac{l}{g}}\right)$, find the value of l, in terms of the other variables
7. Factorise;
   (i) $5xy^2-20yx^2$
   (ii) $8ax+4ay-6bx-3by$
   (iii) $36x^2-25$
   (iv) $x^2-9x+14$
   (v) $6x^2-11x+3$
   (vi) $36x^2-7x-4$
8. Use the quadratic formula to solve $x^2+3\sqrt{3}x+6=0$
9. Factorise;
   (i) x^3-64
   (ii) $27a^3+64b^3$
   (iii) $64-125a^3$
10. Express as a single fraction
    (i) $\frac{3x-4}{6}-\frac{2x+1}{3}$
    (ii) $\frac{3}{4x}-\frac{5}{8x}$

11. By factorising the denominator, simplify $\frac{10}{2x^2-3x-2} - \frac{2}{x-2}$

12. Simplify

(i) $\frac{\frac{1}{x}+1}{\frac{1}{x}-1}$

(ii) $\frac{\frac{1}{x^2}-4}{\frac{1}{x}-2}$

(iii) $\frac{2-\frac{1}{x}}{2}$

(iv) $\frac{2+\frac{1}{x}}{2x^2+x}$

13. If $x^2 + 6x + 16 = (x + a)^2 + b$ for all the values of x, find the values of a and b

14. If $3(x - p)^2 + q = 3x^2 - 12x + 7$ for all x, find the values of p and q

15. Write $\frac{1}{(x+1)(x+4)}$ as a partial fraction $\frac{A}{x+1} + \frac{B}{x+4}$

16. If $(x^2 + b)$ is a factor of $x^3 - 3x^2 + bx - 15$, find the value of b.

17. Make y the subject of the equation

(i) $2x - \frac{y}{3} = \frac{1}{3}$

(ii) $d = \sqrt{\frac{a-b}{ay}}$

18. Solve

(i) $3x + 2 = x + 8$

(ii) $\frac{3x-1}{4} = 8$

(iii) $\frac{3}{4}(2x - 1) - \frac{2}{3}(4 - x) = 2$

19. Solve the simultaneous equations;

(i) $\frac{4x-2}{5} = 8y$

$18x - 20y = 4$

(ii) $2x + y - z = 9$

$x + 2y + z = 6$

$3x - y + 2z = 17$