1. Algebraic expressions

1. Simplify $\dfrac{3Z^2 - 12}{3 - (1 + Z)}$ (3mks)

2. Five year ago, a mother's age was four times that of her daughter. In four years to come, she will be 2 ½ times the age of her daughter. Calculate the sum of their present ages

3. Mutua bought 160 trays of 8 eggs each at shs.150 per tray. On transportation 12 eggs broke. He later discovered that 20 eggs were rotten. If he sold the rest at shs.180 per tray, how much profit did he make?

4. Simplify;
   (a) $6a - 2b + 7a - 4b + 2$
   (b) $\dfrac{2x - 2}{2x}$ $-$ $\dfrac{3x + 2}{4x}$

5. Simplify $\dfrac{6x^2y^2 + 13xy - 5}{3x^2y^2 - 13xy + 4}$

6. Given that $x + y = 8$ and $x^2 + y^2 = 24$
   Find;
   (a) the value of $x^2 + 2xy + y^2$
   (b) Find the value of ; $2xy$
   (c) $x^2 - 2xy + y^2$
   (d) $x - y$
   (e) Value of x and y

7. Simplify the expression.
   $\dfrac{6x^2 + 35x - 6}{2x^2 - 72}$

8. Simplify the expression
   $\frac{2}{3}(3x - 2) - \frac{3}{4}(2x - 2)$

9. Simplify by factorizing completely:
   $\dfrac{4y^2 - x^2}{2x^2 - yx - 6y^2}$

10. Simplify as far as possible.
    $\dfrac{3}{x - y}$ $-$ $\dfrac{1}{x + y}$

11. By calculation, find the coordinates of the intersection of the graphs $\mathbf{y = x^2 + 2x - 5}$ and $\mathbf{y = 3x + 1}$

12. Simplify:
    (a) $\dfrac{\mathbf{y^2 + 2y}}{\mathbf{y^3 - y^2 - 6y}} = \frac{1}{4}$
    (b) hence solve:- $\dfrac{\mathbf{y_2 + 2y = \frac{1}{4}}}{\mathbf{y^3 - y^2 - 6y}}$

13. A rectangular field measures 63.9m by 104.6metres find the minimum number of poles to be

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erected for fencing if they are to be at most 2.4meters apart.

14.   Factorize completely the expression
$75x^2 - 27y^2$

15.   Every time an insect jumps forward the distance covered is half of the previous jump.
If the insect initially jumped 8.4cm, calculate
(i) To the nearest two decimal places distance of the sixth jump
(ii) The total distance covered after the sixth jump

16.   Simplify $\dfrac{P^3 - Pq^2 + P^2q - q^3}{P^2 + 2pq + q^2}$

17.   Simplify the expression:- $\dfrac{9x^2 - 4y^2}{12x^2 + yx - 6y^2}$

18.   Given that $(x-3)(Ax^2+bx+c) = x^3-7x-6$, find the value of A, B and C

19.   a) solve for **y** in $8x(2^2)^y=6x2^y-1$

b) Simplify completely $\dfrac{2x^2-98}{3x^2-16x-35} \div \dfrac{x+7}{3x+5}$

20.   Simplify the expression.:

$\dfrac{4x^2 - y^2}{2x^2 - 7xy + 3y^2}$

21.   Simplify $\dfrac{P^2 -2Pq + q^2}{P^3 - Pq^2 + P^2q - q^3}$

22.   The sum of two numbers is 15. The difference between five times the first number and
three times the second number is 19. Find the two numbers

23.   Simplify the following expressions by reducing it to a single fraction
$\dfrac{2x - 5}{4} - \dfrac{1 - x}{3} - \dfrac{x - 4}{2}$

24.   Simplify the expression:- $\dfrac{3a^2 + 4ab + b^2}{4a^2 + 3ab - b^2}$