Simplify the following expressions:

1. $2a + 3a$

2. $2m + 4m + m + 3m$

3. $4t - 2k + 5k - t$

4. $3p + p - 2p$

5. $3a + a - 2a$

6. $6a - 4a + a$

7. $2m - 4p + m + 9p$

8. $6r + 3m - r + m + 5$

9. $3k - 7b + 2k + 5b$

10. $5y - 7p + y + 10p$

11. $8p - 9 + 2p$
12. $11x + 3 - 2y + 4y - 6x - 3$
13. $5w + 2m - w - 5m$
14. $7a - b + 2a + 3b$
15. $7ab - 2xy + ab + 5xy$
16. $3m + n - 5m - 4n$
17. $4d - 3b - 9d - 2b$
18. $q - 2p - 4q - p$
19. $3y - m + 5m - 7y$
20. $5ab - 2xy - ab + 7xy$

Removing brackets from expressions

1. Simplify: $5k - 2(3 - k)$
2. Simplify: $3y - (2y - 4)$
3. Subtract: $2(c + 6)$ from $6(c - 8)$
4. Subtract: $a - 3$ from $3a - 5$
5. Simplify: $4a - 2(a - 1)$
6. Simplify: $18x - 5(3x + 7)$
7. Simplify: $8m - (2 + m)$
8. Subtract: $q + 2$ from $2q - 4$
9. Subtract: $3(y - 2)$ from $10(y+5)$
10. Subtract: $p - 2$ from $5p$
11. Subtract: $2x + 3$ from $3x - 5$
12. Subtract: $2(x + 1)$ from $x + 13$
13. Subtract: $p + 2$ from $2p - 5$
14. Simplify: $8m - (2 + m)$
15. Simplify: $3p - 2(p - 6)$
16. Simplify: $2(3x - 1) - 4(x - 1)$

17. Simplify: $\dfrac{2(3x - 6)}{6}$

18. Simplify: $6x - 9(x - 2)$
19. Simplify: $2m(3m - 4) - 5m(m - 1)$
20. Simplify: $3q(q - 3) - q(q - 3)$

Algebraic expressions involving powers

1. Simplify: $\dfrac{a^2 \times a^5}{a^3}$

2. Simplify: $\dfrac{b^3 \times b^5}{b^6}$

3. Simplify: $\dfrac{m^2 \times m}{m^3 \times m^2}$

4. Simplify: $\dfrac{b^2 \times b^3}{b^7}$

5. Simplify: $\dfrac{m^5}{m^3}$

6. Simplify: $y^5 \div y^3$

7. Simplify: $r^3 \div r^0$

8. Simplify: $5 \div p^0$

9. Simplify: $m^5 \text{ x } m^{-2}$

10. Simplify: $n^2 \times n$

11. Simplify: $m^6 \div m^3$

12. Simplify: $q^4 \div q^1$

13. Simplify: $k^3 \div k^3$

14. Simplify: $p^2 \times p^{-3}$

15. Work out: $2^3 \times 7^0 \times 0$

16. Work out: $3^2 + k^0$

17. Simplify: $h^2 \div h^{-3}$

18. Simplify: $w^2 \div w^{-2}$

19. Simplify: $\dfrac{b^2 \times b}{b^{-2}}$

20. Simplify: $\dfrac{k^{-2}}{k^{-5}}$

Substitutions

1. Given that $a = -2$, $b = 3$ and $c = 4$, find the value of $b(a^3 - c)$.
2. Given that $a = -2$ and $b = 5$. Find the value of $a^2 - ab$.
3. Given that $a = 3$ and $b = -2$. Find the value of $a^2 - b^3$.
4. Given that $a = -3$, $b = 4$, find the value of $2ab + 2b$.

5. Given that $p = -4$, $q = 3$ and $c = -2$, find the value of $\frac{pq}{c}$.

6. Given that $k = 2$ and $p = -3$, find the value of $3k + 2p$.

7. Given that $a = \frac{1}{3}$ and $b = \frac{1}{9}$. Find the value of $\frac{a}{b}$.

8. Given that $n = 3$ and $r = -2$. Evaluate $\frac{2n + r}{r}$
9. Given that $a = -2$, $b = 3$ and $c = 4$, find the value of $b(a^2 + c)$.
10. Given that $m = 3k$ and $k = 5$. Find the value of $2k + 6m$.

11. Given that $p = 0.64$, $q = 0.8$, find the value of $\frac{p}{q}$.

12. Given that $m = 5$, $n = 3$ and $r = -2$, find the value of $\frac{mn}{n-r}$

13. Given that $m = 8$ and $n = 6$, find the value of $\sqrt{mn + 1}$

14. Given that $a = 2$, $b = 3$ and $c = 5$. Find the value of $\frac{3c + c}{c}$

15. Given that $a = 3$, $b = 5$ and $c = 2$, find the value of $(a - b) + c$.
16. Given that $\pi = \frac{22}{7}$ and $r = 7$, find the value of $\frac{1}{2}\pi r^2$.

17. Given that $a = \frac{1}{3}b$ and $b = 2$, find the value of $a + b$.

18. Given that $k = m^2$ and $m = -3$, find the value of $k^2 - m$
19. Given that $4^2 = 2k$, find the value of $k^2 - 5k$.
20. Given that $m = 0$ and $n = 1$. Evaluate $9^n + 5^m$.

Solving equations

1. Solve: $12 + 3m = 18$
2. Solve: $14 - 2p = 20$
3. Solve: $^-4 + 3m = 11$
4. Solve: $\dfrac{q}{3} - 2 = 4$
5. Solve: $3 - 2(p - 3) + 3 = 6$
6. Solve : $2m + 3 = 18 - m$
7. Solve: $4p - 4 = 20$
8. Solve: $2(3x - 1) - 4(x - 1) = 4$
9. Solve: $2(3x - 6) = 24$
10. Solve: $6x - 9(x - 2) = 3$
11. Solve: $\dfrac{2}{5}m = 4$
12. Solve: $14p + 4 = 11$
13. Solve: $7n + 2 = 23$
14. Solve: $\dfrac{3n}{5} + 6 = 2 + n$
15. Solve: $\dfrac{5}{6}k - 7 = 3$
16. Solve: $\dfrac{12}{m} + 3 = 5$
17. Solve: $2^{3n} \div 2^{n} = 16$
18. Solve: $\dfrac{m}{3} - 2 = 4$
19. Solve: $2^{m} - 1 = 31$
20. Solve: $6 - 0.2y = y$
21. Solve: $\dfrac{3 - 3w}{4} = 6w + 3$
22. Solve: $3r - 3 = 5 + r$
23. Solve: $5 - 3q = 17$
24. Solve: $\dfrac{2}{3}p + 5 = 1 + p$
25. Solve: $3^{2p} \div 3^{p} = 243$
26. Solve: $2m \div 3 - 2 = 4$
27. Solve: $\dfrac{d + 1}{2} = \dfrac{4 - d}{3}$
28. Solve: $3 + 0.4m = m$
29. Solve: $2^{y} - 7^{0} = 7$
30. Solve: $\dfrac{2p + 5}{3} = \dfrac{3p - 5}{2}$

Solving inequalities and solution sets

1. $3 + 4m > 12 + 3m$

2. $9 \leq {}^-3(y - 1)$

3. $\frac{2}{3}m - 1 < 1$

4. $7 < 3x - 2 < 16$

5. $9 - 2k > k + 3$

6. $3 - 2m < 15$

7. $\frac{k + 2}{2} > \frac{2k}{3}$

8. $12 < 2x < 20$

9. $7 - k > k + 1$

10. $8 \leq {}^-2(p - 1)$

Application of algebra
Activity 1

1. Think of a number, subtract 3 from it and the result is 7.
   What is the number?

2. A number added to 7 gives 12. Find the number.

3. When a number is divided by 3, the result is 12.
   What is the number?

4. Twice a number and divide it by 3 , the result is 6.
   What is the number?

5. Twice a number, divide it by 3 and add 4 to it. The result is 16.
   Find the number?

6. When one is removed from two thirds of a number, the result is the
   number less than four. Find the number.

7. When you remove 4 from twice of a number, the result is 8.
   What is the number?

8. When 2 is added to a third of a number, the result is 7.
   If the number is k, find the value of k.

9. Three fifth of a number is equal to two plus the number.
   Find the number.

10. A parent had some sweets, he gave 10 sweets to Maria and 7 sweets
    to Sarah. If the parent remained with 14 sweets,
    how many sweets did he have at first?

Activity 2

1. Sherin is 3 years younger than Shanitah. Their total age is 19 years. How old is Shanitah?

2. Betty is 9 years older than Kato and their total age is 35.
How old is Betty?

3. Musa is 4 years younger than Sam, the sum of their age is 28.
How old is Musa?

4. James is 3 years younger than Tom. John is 2 years younger than James. If their total age is 34, how old is each?

5. Dennis is 5 years younger than Derrick, their total age is 23.
How old is each?

6. Lubega is 5 years younger than Muwonge, if Muwonge is (k−2) years old. How old is each?

7. Mulungi is 4 years younger than Isabella. How old is Isabella if the sum of their age is 22?

8. Akena is thrice as old as his daughter Anyakot. The difference in their age is 24.
   a) How old is Akena?
   b) How old was Anyakot five years ago?

9. Ojok is 5 years younger than Kenneth. James is twice as old as Ojok. How old is Ojok if the age of James is 30?

10. A son is a fifth as old as his father. If the sum of their age is 36, how old is the son?

11. Samuel is 3 years younger than Peter. Dan is 5 years older than Samuel. If the age of the three pupils is 41, how old is Dan?

12. Dinah is four years younger than Deborah. Daniella is two years younger than Dinah. If the age of Dinah and Daniella is 32, how old is Daniella?

13. The cost of a pen is two fifth the cost of a book. The cost of a ruler is sh750 less than the cost of a book. Kevin paid sh.3450 for all the three items. Find the cost of each item.

14. Berinda is 4 times as old as Erick. The difference in their age is 27. How old is Berinda?

15. Nanziri has two children, a son and a daughter. If the son is a half her age, the daughter a third her age and the total age of the two children is 30 years.
   a) find Nanziri's age
   b) how old is the daughter?

16. Nassozi is 5 years older than Grace. If Grace is (m–3) years old and their total age is 23. How old is Nassozi?
17. Okoth is thrice as old as Otim. If Otim is (w–2) years old and the difference in their age is 22 years. How old is each?
18. Jordan is 5 years younger than James. Jonah is 2 years younger than Jordan. The sum of the age of Jonah and Jordan is 24 . How old is Jonah?
19. The daughter is a third of her mother's age and the sum of their age is 32. How old is the daughter?
20. Charity has a third of Cathy's eggs and Charles has a half of Cathy's eggs. Charles and Charity have 25 eggs.
   a) How many eggs does Cathy have?
   b) How many eggs does Charles have?

Activity 3

1. The cost of a phone is 4 times the cost of a charger.
   A charger costs sh.(w + 2000). If a customer paid sh.110,000 for a phone and a charger, how much did the customer pay for the phone?
2. Mrs. Mandera bought two geometry sets each at sh.(x + 500) and one counter book at sh.3(x –100). If she spent sh.5700 altogether. What was the cost of each item?
3. In a market, the cost of an apple is sh.(p + 700). The cost of a mongo is sh.400 less than the cost of an apple.
   Amina paid sh.5700 for 2 mangoes and 3 apples.
   What is the cost of each item?

4. A book costs three times as much as a pencil. A pen costs sh.300 more than a pencil. If a book costs as much as a pen and a pencil, find the cost of a book.

5. A book costs thrice as much as a fountain pen.
   Fatuma paid sh.4500 for a book.
   a) How much does a fountain pen cost?
   b) How much did she pay for the two items?

6. At a stationary, the cost of a pen is twice the cost of a pencil.
   The cost of a book is sh.1200 more than the cost of a pen.
   If the cost of a pen and a pencil is sh.900.
   Find the cost of 2 books.

7. In a market, the cost of a pineapple is sh.2000 less than the cost of a watermelon. Mr.Ssengabi paid sh. 11,000 for a watermelon and two pineapples.
   How much was the cost of a pineapple?

8. A mathematical set costs sh.2000 more than an exercise book.
   The cost of two exercise books is the same as $\frac{2}{5}$ of the cost of a mathematical set.
   Find the cost of an exercise book.

9. At a boutique, the cost of a shirt is 20% more than the cost of a trouser. Hassan saved sh.12,000 on buying a trouser instead of a shirt. Calculate his total cost if he bought both a shirt and a trouser.

10. The cost of a cup is 0.2 less than the cost of a plate. Alex paid sh.5400 for a plate only.
    Calculate the money paid on buying both a plate and a cup.

Activity 4

1. Kizito is 30 years old and his son is 24 years old.
   How many years ago was Kizito three times as old as his son?

2. Dan is 20 years old. Atovura is 12 years old.
   In how many years ago was Dan twice as old as Atovura?

3. Paul is 32 years old. John is 14 years old.
   In how many years will Paul's age be twice as old as John?

4. Sandra is 21 years old. Cissy is 5 years old .
   In how many years will Sandra's age be thrice as old as Cissy?

5. James is 19 years old . Otim is 8 years younger than James.
   In how many years ago was James' age thrice as old as Otim?

END OF TOPIC

SUCCESS IS WORKED FOR NOT JUST TALKED ABOUT!!!!!!