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FRAMING ALGEBRAIC EXRESSIONS

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 21
CHAPTER NAME:FRAMING ALGEBRAIC EXPRESSIONS.
SUB TOPIC: Framing Algebraic Expressions**.**
PERIOD NO:1

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Learning outcomes

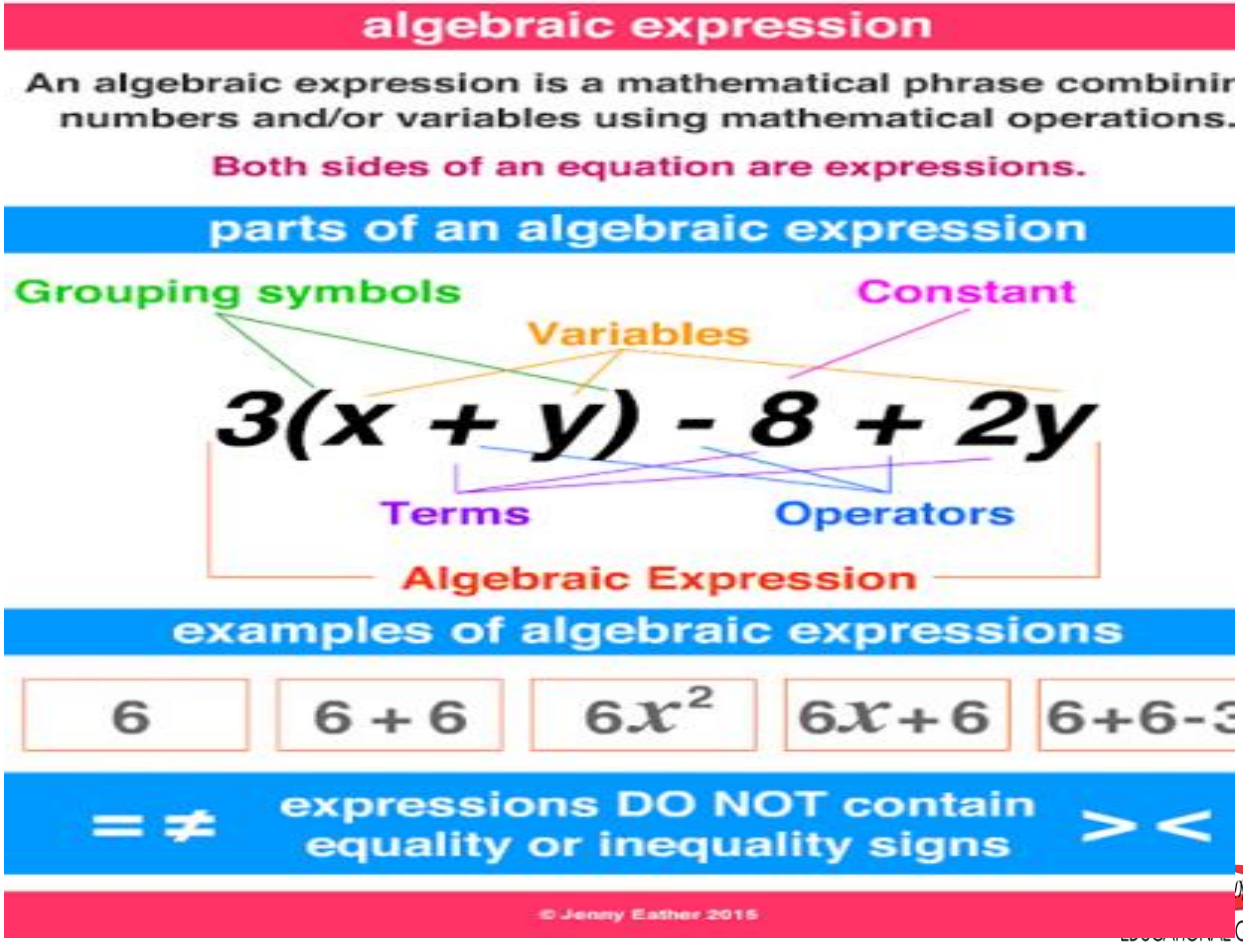
Students will be able to frame algebraic expressions.

Students will be able to convert real life situations into algebraic expressions.

FRAMING ALGEBRAIC EXPRESSIONS

Concept of framing algebraic expression will be explained using a video.
https://www.youtube.com/watch?v=lxHM4i4kwoQ(12.5)

FRAMING ALGEBRAIC EXPRESSIONS

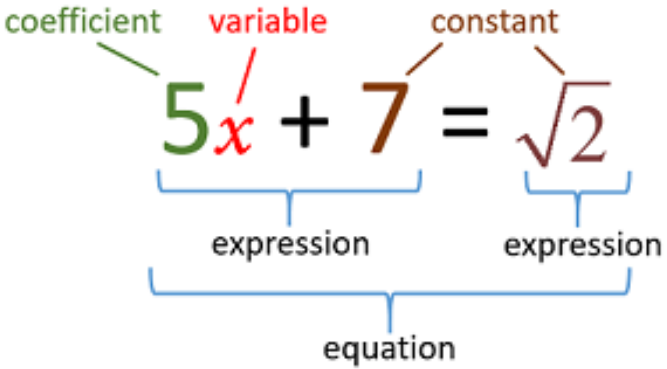


FRAMING ALGEBRAIC EXPRESSIONS

Algebraic Expressions

Coefficients

$2x + 3y - 7$



Terms: $5x$, 7, $\sqrt{2}$

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Evaluation Question EXERCISE 21

1. Write in the form of an algebraic expression:

(i) Perimeter (P) of a rectangle is two times the sum of its length (l) and its breadth (b).

(ii) Perimeter (P) of a square is four times its side.

(iii) Area of a square is square of its side.

(iv) Surface area of a cube is six times the square of its edge.

Solution: (i) Let us assume the length be l, breadth be b and perimeter be P. Then the algebraic expression for the given statement is written as,

$P = 2 (l + b)$

(ii) Let us assume the side be s and perimeter be P. Then the algebraic expression for the given statement is written as,

$P = 4s$

Evaluation Question

2. Express each of the following as an algebraic expression:

(i) The sum of x and y minus m.

(ii) The product of x and y divided by m.

(iii) The subtraction of 5m from 3n and then adding 9p to it.

(iv) The product of 12, x, y and z minus the product of 5, m and n.

(v) Sum of p and 2r – s minus sum of a and 3n + 4x.

Solution:

(i)The algebraic expression for the given sentence is given below

x + y – m

(ii) The algebraic expression for the given sentence is given below

xy / m

Evaluation Question

3. Construct a formula for the following:

Total wages (Rs W) of a man whose basic wage is (Rs B) for t hours week plus (Rs R) per hour, if he works a total of T hours.

Solution:

The wages for t hours is Rs B.

The wages for overtime is R(T – t)

Hence, the total wages is calculated as given below,

W = B + R(T – t)

4. If x = 4, evaluate:

(i) 3x + 8 **(ii) $x^2 – 2x$** **(iii) $x^2 / 2$**

5. If m = 6, evaluate:

(i) 5m – 6 **(ii) $2m^2 + 3m$** **(iii) $(2m)^2$**

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Evaluation Question

Solution:

(i) $3x + 8$

The value of $3x + 8$ for $x = 4$ is calculated as below

Now, substituting $x = 4$ in the given equation, we get

$3x + 8 = 3 \times 4 + 8$

$= 12 + 8$

$= 20$

Therefore, the value of $3x + 8$ for $x = 4$ is 20

(ii) $x^2 – 2x$

The value of $x^2 – 2x$ for $x = 4$ is calculated as below

Now, substituting $x = 4$ in the given equation, we get

$x^2 – 2x = 4^2 – 2 \times 4$

$= 16 – 8 = 8$

Therefore, the value of $x^2 – 2x$ for $x = 4$ is 8

Evaluation Question

Solution:

(iii) $x^2 / 2$

The value of $x^2 / 2$ for x =4 is calculated as below

$x^2 / 2 = 4^2 / 2$

$= 16 / 2 = 8$

Therefore, the value of $x^2 / 2$ for x = 4 is 8

5.Solution:

(i) 5m – 6

The value of 5m – 6 for m = 6 is calculated as below

Now, substituting the value of m = 6 in the given equation, we get

$5m – 6 = 5 \times 6 – 6$

$= 30 – 6 = 24$

Hence, the value of 5m – 6 for m = 6 is 24

Evaluation Question

(ii) $2m^2 + 3m$

The value of $2m^2 + 3m$ for m = 6 is calculated as below

Now, substituting the value of m = 6 in the given equation, we get

$2m^2 + 3m = 2(6)^2 + 3(6)$

$= 2 \times 36 + 3 \times 6$

$= 72 + 18 = 90$

Hence, the value of $2m^2 + 3m$ for m = 6 is 90

(iii) The value of $(2m)^2$ for m = 6 is calculated as below

Now, substituting the value of m = 6 in the given equation, we get

$(2m)^2 = (2 \times 6)^2$

$= 12^2 = 144$

Hence, the value of $(2m)^2$ for m = 6 is 144

Evaluation Question

6. If x = 4, evaluate:

(i) 12x + 7

(ii) $5x^2 + 4x$

(iii) $x^2 / 8$

Solution:(i) substituting the value of x = 4 in the given equation, we get

$12x + 7 = 12 \times 4 + 7$

$= 48 + 7 = 55$

Therefore, the value of 12x + 7 for x = 4 is 55

(ii) The value of $5x^2 + 4x$ for x = 4 is calculated as follows,

Substituting the value of x = 4 in the given equation, we get

$5x^2 + 4x = 5 \times 4^2 + 4 \times 4$

$= 5 \times 16 + 16 = 80 + 16 = 96$

Therefore, the value of $5x^2 + 4x$ for x = 4 is 96

- (iii) $x^2 / 8$
- The value of $x^2 / 8$ for x = 4 is calculated as follows,

Evaluation Question

(iii) $x^2 / 8$

The value of $x^2 / 8$ for $x = 4$ is calculated as follows,

$x^2 / 8 = 4^2 / 8$

$= 16 / 8 = 2$

Therefore, the value of $x^2 / 8$ for $x = 4$ is 2

7. If m = 2, evaluate:

(i) 16m – 7

(ii) $15m^2 – 10m$

(iii) $1 / 4 \times m^3$

i)Solution : The value of 16m – 7 for m = 2 is calculated as below,

$16m – 7 = 16 \times 2 – 7 = 32 – 7 = 25$

Hence, the value of 16m – 7 for m = 2 is 25

Evaluation Question

(ii) $15m^2 – 10m$

The value of $15m^2 – 10m$ for m = 2 is calculated as below,

$15m^2 – 10m = 15 \times 2^2 – 10 \times 2$

$= 15 \times 4 – 20$

$= 60 – 20 = 40$

Hence, the value of $15m^2 – 10m$ for m = 2 is 40

(iii) $1 / 4 \times m^3$

The value of $1 / 4 \times m^3$ for m = 2 is calculated as below,

$1 / 4 \times m^3 = 1 / 4 \times 2^3$

$= 1 / 4 \times 8 = 2$

Hence the value of $1 / 4 \times m^3$ for m = 2 is 2

Evaluation Question

8. If x = 10, evaluate:

(i) 100x + 225

(ii) $6x^2 – 25x$ (iii) $1 / 50 \times x^3$

Solution:

(i)The value of 100x + 225 for x = 10 is calculated as follows,

100x + 225 = 100 × 10 + 225

= 1000 + 225= 1225

Therefore, the value of 100x + 225 for x = 10 is 1225

(ii)The value of $6x^2 – 25x$ for x = 10 is calculated as follows,

$6x^2 – 25x = 6 \times 10^2 – 25 \times 10$

= 6 × 100 – 250

= 600 – 250 = 350

Evaluation Question

(iii) $1 / 50 \times x^3$

The value of $1 / 50 \times x^3$ for $x = 10$ is calculated as follows,

$1 / 50 \times x^3 = 1 / 50 \times 10^3$

$= 1 / 50 \times 1000$

We get,

$= 20$

Therefore, the value of $1 / 50 \times x^3$ for $x = 10$ is 20

Additional Homework

1. Fill in the blanks:

(i) 8x + 5x = …….

(ii) 8x – 5x = ……

(iii) $6xy^2 + 9xy^2$ = …….

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