3.1 Warmup Exercises

Identify Variables and Constants

1. Mood:
2. Sun:
3. Monalisa's face:
4. Hair:
5. Temperature:
6. India:
7. Your Name:
8. Donald Trump:
9. World Records:
10. Change:

Give ten examples of constants

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Give ten examples of constants

1.
2.
3.
4.
5.

6.
7.
8.
9.
10.

3.2.1 Addition

Ex1: Write the expression: x is added to the sum of x and 5.

Toy Problem: 5 is added to the sum of 5 and 5

sum of 5 and 5 : 5 +5

5 is added to the sum: 5 + (5 + 5)

Operation to be used: Addition

Algebra Problem: x + (x + 5)

Q1: Write the expression: 2x is added to the sum of x and 123.

Toy Problem:

Operation to be used:

Algebra Problem:

Q2: Write the expression: 2x is added to the sum of 12x and 65.

Toy Problem:

Operation to be used:

Algebra Problem:

Q3: Write the expression: 5x is added to the sum of 2x and 67.

Toy Problem:

Operation to be used:

Algebra Problem:

3.2.2 Word problems on Addition

Ex1: Raju has "x" rupees with him. He was given "y" more rupees. He won "z" rupees in a lottery. How much money does he have?

Toy Problem: Raju has "100" rupees (x)

He was given another "200" rupees (y)

He won "100" in lottery (z)

Total Money: 100 + 200 + 100 = 400

Operation to be used: Addition

Algebra Problem: x + y + z (100 + 200 +100)100100)

Q1: Vamsi has "2x+3y" chocolates with him. He was given "3y+4z" more chocolates. He won "4z+2x" chocolatesin a game. How many chocolates does he have?

Toy Problem:

Total Money:

Operation to be used:

Algebra Problem:

Q2: Seetha has "2x" stamps with her. She was given "3y" stamps more. She got "4z" stamps from his father. How many stamps does she have?

Toy Problem:

Total Money:

Operation to be used:

Algebra Problem:

Q3: Sam has "x" chocolates with him. He was given "2x" more chocolates. He won "8x" chocolatesin a game. How many chocolates does he have?

Toy Problem:

Total Money:

Operation to be used:

Algebra Problem:

3.2.3 Subtraction

Ex1: Write the expression: x is subtracted from 5 less than x.

Toy Problem: 10 is subtracted from 5 less than 10

5 less than 10: 10 -5

10 is subtracted from: (10 – 5) - 10

Operation to be used: Subtraction

Algebra Problem: (x – 5) - x

Q1: Write the expression: (3x) is subtracted from 15 less than 2x.

Toy Problem:

Operation to be used:

Algebra Problem:

Q2: Write the expression: (2x+5) is subtracted from 10 less than x.

Toy Problem:

Operation to be used:

Algebra Problem:

Q3: Write the expression: (3x+2y) is subtracted from 10 less than 5y.

Toy Problem:

Operation to be used:

Algebra Problem:

3.2.4 Word Problems on Subtraction

Ex1: Raju has "x" rupees with him. He lent "y" rupees to Ravi. He lost "z" rupees. How much money does he have now?

Toy Problem: Raju has "100" rupees (x)

He lent "50" rupees (y)

He lost "30" rupees (z)

Total Money: 100 – 50 – 30

Operation to be used: Subtraction

Algebra Problem: x – y – z (100-50- 30)

Q1: Ram has "3x" rupees with him. He lent "2x" rupees to Ravi. He lost "x" rupees. How much money does he have now?

Toy Problem:

Total Money:

Operation to be used:

Algebra Problem:

Q2: Ravan has "2x+4y" chocolates with him. He lent "2x" chocolates to Kumbakarna. He lost "3y" choclates. How many chocolates does he have now?

Toy Problem:

Total Money:

Operation to be used:

Algebra Problem:

Q3: Kapil has "3x" cookies with him. He lent "2y" cookies to Dev. He lost "4z" cookies. How many cookies does he have now?

Toy Problem:

Total Money:

Operation to be used:

Algebra Problem:

3.3.1 Multiplication

Ex1: x is multiplied with the product of y and 5

Toy Problem: 20 is multiplied to the product of 10 and 5

product of 10 and 5: 10 * 5

20 is multiplied with the product: 20 * (10 *5)

Operation to be used: Multiplication

Algebra Problem: x * (y * 5)

Q1:3x is multiplied with the product of x and y

Toy Problem:

Operation to be used:

Algebra Problem:

Q2:8x is multiplied with the product of 7y and 4z

Toy Problem:

Operation to be used:

Algebra Problem:

Q3:4y is multiplied with the product of 3y and 15

Toy Problem:

Operation to be used:

Algebra Problem:

3.3.2 Word Problems on Multiplication

Ex1: A school has “a” rooms, a room has “x” benches, each bench has “y” pencils. How many pencils does the school have?

Toy Problem: The school has 40 classrooms

Each classroom has 20 benches

Each bench has 5 pencils

Number of pencils in one class = 20 benches * 5 = 100

Number of pencils in the school (40 classes) = 40 * (20 * 5)

Operation to be used: Multiplication

Algebra Problem: a * (x * y)

Q1: A suitcase has “3x” boxes, a box has “4y” chocolates, each chocolates has “2z” stickers. How many stickers does the suitcase have?

Toy Problem:

Operation to be used:

Algebra Problem:

Q2: A garden has “22x” plants, a plant has “10x” flowers, each flower has “3x” petals. How many petals does the garden have?

Toy Problem:

Operation to be used:

Algebra Problem:

Q3: A fleet has “2x” cars, a car has “x+5” wheels, each wheel has “3x” wheels. How many wheels does the carhave?

Toy Problem:

Operation to be used:

Algebra Problem:

3.3.3 Division

Ex1:x is divided by the quotient of y and 5

Toy Problem: 20 is divided by the quotient of 10 and 5

Quotient of 10 and 5 : 10 / 5

20 is divided by : 20 / (10 / 5)

Operation to be used: Division

Algebra Problem: x / (y / 5) (20 / (10 /5))

Q1:2x is divided by the quotient of 3y and 4z

Toy Problem:

Operation to be used:

Algebra Problem:

Q 3.7.2:13x is divided by the quotient of x and 10

Toy Problem:

Operation to be used:

Algebra Problem:

Q 3.7.3:12x is divided by the quotient of x and 22

Toy Problem:

Operation to be used:

Algebra Problem:

3.3.4 Word Problems on Division

Ex1: x chocolates were packed in y cartons. Each carton has z packets. How many chocolates does each packet have?

Toy Problem: 100 chocolates are to be packed in 10 cartons, each carton has 5 packets.

Number of chocolates in one carton = 100/10

Number of chocolates in one packet = (100/10)/5

Operation to be used: Division

Algebra Problem: (x / y) / z

Q1: 4x petals were in 2x plant. Each plant has 2x flowers. How many petals does each flower have?

Toy Problem:

Operation to be used:

Algebra Problem:

Q2: 2x spokes were in 4y cars. Each car has 3z wheel. How many spokes does each wheel have?

Toy Problem:

Operation to be used:

Algebra Problem:

Q3: 10 chocolates were in x suitcase. Each suitcase has y boxes. How many chocolates does each box have?

Toy Problem:

Operation to be used:

Algebra Problem:

3.4.1 Combination of Addition and Multiplication

Ex1:x is added to the product of y and 10

Toy Problem: 20 is added to the product of 4 and 10.

Product of 4 and 10: 4 * 10 = 40

20 is added: 20 + (4 * 10)

Operation to be used: Addition and Multiplication

Algebra Problem: (x + (y * 10))

Q1:2x is added to the product of 2y and 2z

Toy Problem:

Operation to be used:

Algebra Problem:

Q2:2y is added to the product of (2x+2y) and 2z

Toy Problem:

Operation to be used:

Algebra Problem:

Q3:x is added to the product of 2x and 4x

Toy Problem:

Operation to be used:

Algebra Problem:

3.4.2 Combination of Subtraction and Division

Ex1: x is subtracted from the quotient of y and 10

Toy Problem: 2 is subtracted from the quotient of 40 and 10.

Quotient of 40 and 10: 40/10

2 is subtracted from : (40/10 – 2)

Operation to be used: Division and Subtraction

Algebra Problem: (y / 10) - x

Q1:4x is subtracted from the quotient of 2y and 4z

Toy Problem:

Operation to be used:

Algebra Problem:

Q2:8x is subtracted from the quotientof 3x and 2x

Toy Problem:

Operation to be used:

Algebra Problem:

Q3:6z is subtracted from the quotient of 2y and 4

Toy Problem:

Operation to be used:

Algebra Problem:

3.5.1 Algebraic Substitution

Ex1: Find the value of 3x + 10

if x =3

Expanded form: (3 * x) + 10

Substitution: (3 * 3) + 10 = 19

Q1: Find the value of 2x + 4y

if x =6 , y=10

Expanded form:

Substitution:

Q2Find the value of 6x +4y +10z

if x =3 ,y= 5 ,z=1

Expanded form:

Substitution:

Q3: Find the value of 5x+4y+3z

if x =1,y= 5, z=2

Expanded form:

Substitution:

Q4: Find the value of 5x

if x =5

Expanded form:

Substitution:

Q5: Find the value of 3z+y

if y= 8, z=6

Expanded form:

Substitution:

Q6: Find the value of 0x+4y

if x =1,y= 10

Expanded form:

Substitution:

Q7: Find the value of 2x+40 if x =1

Expanded form:

Substitution:

3.5.2 Verifying the Expressions

Ex1: Check if x=3 solves 3x + 10 = 20

Substituting LHS: (3 *x) + 10

(3 * 3) + 10 = 19

Substituting RHS: 20

Is LHS = RHS? No

Verdict: x =3 doesn't satisfy the equation

3x + 10 = 20

Q1: Check if x=5,y=5solves

3x + 3y = 30

Substituting LHS:

Substituting RHS:

Is LHS = RHS?

Verdict:

Q.2: Check if x=1 ,y=5,z=1solves

4x+5y+6z=51

Substituting LHS:

Substituting RHS:

Is LHS = RHS?

Verdict:

Q3: Check if x=10,y=5 solves

x+y=5

Substituting LHS:

Substituting RHS:

Is LHS = RHS?

Verdict:

Q4: Check if x=7 solves 56x + 45 = 67

Substituting LHS:

Substituting RHS: 20

Is LHS = RHS? No

Verdict: x =3 doesn't satisfy the equation

Q5: Check if x=3,y=9 solves

5x + 9y = 9x + 5y

Substituting LHS:

Substituting RHS:

Is LHS = RHS?

Verdict:

Q6: Check if x=9 ,y=2,z=5solves

x + y + z = (x * y) + (z * z)

Substituting LHS:

Substituting RHS:

Is LHS = RHS?

Verdict:

Q7: Check if x=15,y=25 solves

x * y = x + y

Substituting LHS:

Substituting RHS:

Is LHS = RHS?

Verdict: