DOON PUBLIC SCHOOL, BHUJ
HOME ASSIGNMENT
VII
Mathematics

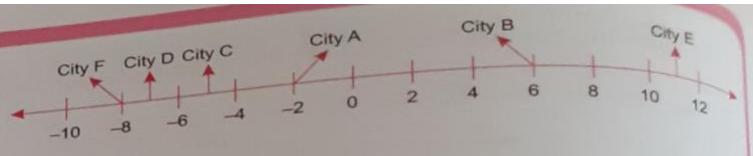
Dear Students,
This is your home assignment which you have to complete in your **Math's** notebook. Write all the following chapters very neatly in the notebook and practice the same. This assignment will be checked on reopening of the school. Manage your time effectively as time is free, but it is priceless. I wish you to have great time with your family during this vacation. Take care and stay safe!

CHAPTER-1
INTEGERS

Exercise 1.1-:

Exercise 1.1

1. The number line given alongside shows the temperatures in °C recorded at different cities on a particular day. Based on the number line, answer the following questions.



   a. Write the temperatures recorded for the following cities.
      City F, City E, City A, City B
   b. Find the difference in temperatures between the hottest city and the coldest city.
   c. Find the difference between the temperatures in City B and City C.
   d. Write the name of the cities in the descending order of their recorded temperatures.

2. In a quiz competition, the points scored by two teams are given below. Find out which team performed better.

Round → / Team ↓	Points scored in different rounds				
	1	2	3	4	5
A	−5	8	15	−9	3
B	−3	10	20	−8	−4

3. The minimum temperature during winter in a place is −6 °C on a particular day. The next day, the temperature dropped by 3 °C. The temperature rose by 2 °C on the third day. Find the temperatures recorded on these two days.

4. Look at the numbers in the box.

	−5	4	−21
−11	6	−9	−10
	20	−6	1

   a. Find three numbers from the box whose sum is zero.
   b. Find two numbers whose sum is the minimum.
   c. Find the numbers whose difference is maximum.
   d. Find four numbers whose sum is 5.

5. Check which of the following is a magic square. In a magic square, each row, column and diagonal have the same sum.

   a.

7	−7	−6	4
−4	2	1	−1
0	−2	−3	3
−5	5	6	−8

   b.

0	−7	−2	−4
−5	−3	−1	−7
0	−2	−3	1
−4	1	−6	0

6. A taxi driver started his first trip from the taxi stand towards the south. He covered 75 km in this direction to reach town A. From there, he travelled back on the same road and covered 90 km to reach another town B.
   a. How far is he from the stand?
   b. If the distance towards the south is denoted by a positive number, then how will you represent the distance travelled towards the north?
   c. Find the integer that represents the distance travelled from the taxi stand to town B.

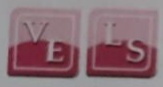
7. State whether the following statements are true or false.
   a. $23 - (-21) = 23 + 21$
   b. $23 + (-21) < (-23) + 21$
   c. $(-5) + (-6) + (-7) > 7 - 77$
   d. $(-100) + (99) + (-1) = 97 - 99 + 4$
   e. $56 - (49 - 7) < (56 - 49) - (-7)$
   f. $13 - 31 > 3 - 13 - 31$

8. Write the missing numbers in the following magic squares.
   a.

4		2
	1	
		−2

b.

9	16	–7		7
15	–3		6	8
		5		14
2	4	11	13	
	10		–6	1



The students of a school have to submit their maths assignments every Monday. The teacher awards 2 marks if a student submits the assignment on Monday and reduces 1 mark for late submission.

a. Find the marks awarded to the following students after 4 weeks.
   (i) Tanya submitted her assignments thrice on Monday and once on Tuesday.
   (ii) Vivek submitted his assignments thrice on Tuesday and once on Monday.

b. Give your views on the value of sense of accomplishment.

c. What skills should one develop so that he/she avoids delay in his/her work?

Solution-:

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Exercise 1.1 (Page 4)

1. The temperature of City F is –8°C.
The temperature of City E is 11°C.
The temperature of City A is –2°C.
The temperature of City B is 6°C.

b. The hottest city is City E. The temperature of city E is 11°C.
The coldest city is City F. The temperature of city F is –8°C.
Difference in temperatures = 11°C – (–8°C) = 11°C + 8°C =19°C

Temperature of City B = 6°C; Temperature of City C = –5°C
Difference between the temperatures = 6°C – (–5°C) = 6°C + 5°C = 11°C

d. On the number line, the numbers are arranged in descending order from right to left.
Hence, the name of the cities in descending order of the recorded temperatures are:

ity E > City B > City A > City C > City D > City F

2. Total score of Team A = –5 + 8 + 15 – 9 + 3 = 8 + 15 + 3 –5 – 9 = 26 – 14 = 12
Total score of Team B = –3 + 10 + 20 – 8 – 4 = 10 + 20 – 3 – 8– 4 = 30 – 15 = 15
Total score of Team A is 12 which is less than the total score of Team B.
So, Team B performed better.

3. Temperature on a day is –6°C. The next day, the temperature dropped by 3°C.
∴ Temperature on the second day = –6°C – 3°C = –9°C

n the third da , the temperature rose by 2°C.

∴ Temperature on the third day = −9°C + 2°C = −7°C

4. a. From the given numbers if we add −11, −9, 20, we get zero

$$(-11) + (-9) + 20 = -11 - 9 + 20 = -20 + 20 = 0$$

b. From the given numbers, sum of −21 and −11 gives the minimum value

$$-21 + (-11) = -21 - 11 = -32$$

c. From the given numbers, difference between the numbers 20 and −21 gives maximum value. $20 - (-21) = 41$

d. From the given numbers, sum of 6, 4, −6 and 1 gives 5.

$$6 + 4 - 6 + 1 = 6 - 6 + 4 + 1 = 0 + 5 = 5$$

5. .

	col 1	col 2	col 3	col 4	um
row 1		−7	−6	4	−2
ow 2	−4		1	−1	−2
row 3	0	−2	−3	3	−2
row 4	−5	5	6	−8	−2
um	−2	−2	−2	−2	

Diagonal 1 = 7 + 2 −3 − 8
= 9 − 11 = −2

Diagonal 2 = 4 + 1 − 2 − 5
= 5 − 7 = −2

In this square, the sum of the numbers in all the rows, columns and diagonals is the ame. So, it is a magic square.

.

	col 1	col 2	col 3	col 4	um
row 1	0	−7	−2		−13
ow 2	−5	−3	−1	−7	−16
row 3	0	−2	−3	1	−4
row 4	−4	1		0	−9
	−9	−11	−12	−10	

n this square, the sum of the numbers in all the rows and columns is different. So, it is ot a magic square.

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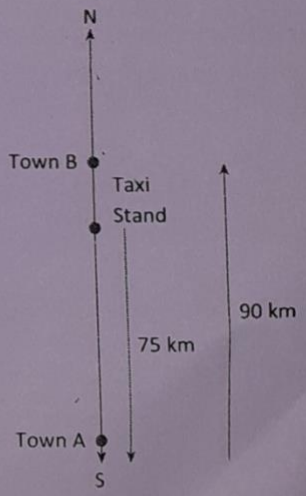
6. a. Distance travelled from town A to town B = 90 km
Distance travelled from the stand to town A = 75 km
Distance between stand and town B = 90 km − 75 km = 15 km
∴ He is 15 km away from the stand.

b. The distance travelled towards the north will be represented by a negative number because the north direction is opposite to the south direction.

*c. Distance from town A to town B is 90 km.
Distance from the stand to town A is 75 km.
So, the distance from the stand to town B
= 90 km − 75 km = 15 km



7. a. $23 - (-21) = 23 + 21$
$23 + 21 = 23 + 21$
$44 = 44$
HS = RHS
o, it is true.

b. $23 + (-21) < (-23) + 21$
LHS = $23 + (-21) = 23 - 21 = +2$
RHS = $(-23) + 21 = -23 + 21 = -2$
$23 + (-21) < (-23) + 21 \Rightarrow +2 < -2$
But −2 is less than 2. So, it is false.

*Note for the Teacher: Kindly ignore the answer given in the textbook, and consider the solution given here.

. $-5) + (-6) + (-7) > 7 - 77$

$(-5) + (-6) + (-7) = -5 - 6 - 7 = -1$

HS $= 7 - 77 = -70$

$-5) + (-6) + (-7) > 7 - 77 \Rightarrow -18 > -70$

o It is true.

d. $(-100) + (99) + (-1) = 97 - 99 + 4$

$-100 + 99 - 1 = 97 - 99 + 4$

$-101 + 99 = 101 - 99 \Rightarrow -2 \neq 2$

t is f lse, because -2 is not qual to 2.

e. $56 - (49 - 7) < (56 - 49) - (-7)$

$56 - 42 < (56 - 49) - (-7)$

$6 - 42 < 7 - (-7)$

$6 - 42 < 7 + 7 \Rightarrow 14 < 14$; It is false.

$3 - 31 > 3 - 13 - 31$

$-18 > 3 - 44 \Rightarrow -18 > -41$

t is true.

8. a. In a magic square if we add all the numbers in a row, column, or diagonal, we get the ame sum.

The sum of the number in the diagonal $= 4 + 1 - 2 = 3$

So, we fill the empty cells to get the sum of the numbers as 3 in each row and column.

4	−3	2
−1	1	3
0	5	−2

n a magic squar the sum of all the numbers in each row, column, or diagonal is the same. The sum f the numbers in the diagonal

$= 9 - 3 + 5 + 13 + 1 = 25$

Now fill the empty cells to get value 25 as the sum of the numbers in each row, column, or diagonal.

9	6	−7		
5	−3	−1		
−4	−2		2	4
		1	3	−5
	0	7	−6	

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VE LS (Page 5)

a. i. Tanya submitted assignments thrice on Monday so she gets 3 times 2 marks

$3 \times 2 = 6$

She submits once on Tuesday, so one mark is reduced. So, she gets 1 mark.

Marks awarded to Tanya $= 6 + 1 = 7$; Tanya got 7 marks.

ii. Vivek submitted the assignments three times on Tuesday, so three marks are reduced and he got three marks.

He submits once on Monday and so he got two marks.

Marks awarded to Vivek $= 3 + 2 = 5$; Vivek got 5 marks.

Exercise 1.2-:

amount received = 125 + (–98) = +27

So, he gained ₹27.

Exercise 1.2

1. Write down a pair of integers whose
   a. sum is –6. b. difference is –5.
   c. sum is 1. d. difference is –1.
2. a. Write down a pair of negative integers whose difference is 2.
   b. Write down a pair of positive integers whose difference is more than –4.
   c. Write down a negative integer and a positive integer whose sum is –1.
3. Represent the given numbers in the following ways.
   a. As the sum of two integers
   b. As the difference of two integers
      i. 1 ii. 3 iii. –2
4. Fill in the blanks to make the following statements true.
   a. (–27) + (–52) = (–52) + _____
   b. (–27) + _____ = (–27)
   c. (–27) + _____ = 0
   d. [(–27) + (–52)] + (_____)
      = (_____) + [(–52) + 100]
5. You are given the following integers in a box. Using these integers, write

5	3
(–4)	1
(–1)	(–3)
(–6)	

   a. a pair of integers whose sum is
      i. an integer greater than 7
      ii. zero
      iii. an integer smaller than –7
      iv. an integer smaller than 0
      v. the least
   b. a pair of integers whose difference is
      i. an integer greater than –4
      ii. a negative integer
      iii. an integer greater than 6
      iv. an integer greater than 10
      v. the least

Multiplication of Integers

We know that multiplication is repeated addition. If we add 4 repeatedly 3 times, we get 4 + 4 + 4 = 12 or 3 × 4 = 12.

Solution-:

Exercise 1.2 (Page 7)

1. Answer may vary

. e us consider the integers –4 and –2. –4 – 2 = –6

. e us consider the integers –6 and –1. –6 – (–1) = –6 + 1 = –5

. e us consider the integers 2 and –1. 2 – 1 = 1

. e us consider the integers 4 and 5. 4 – 5 = –1

2. a. The negative integers are –4, –6. Difference = –4 – (–6) = –4 + 6 = 2

. et us consider the numbers 1 and 3. 1 – 3 = –2. Here, –2 > –4

c. Let us consider the negative integer –3 and the positive integer 2
–3 + 2 = –1

3. . . et us consider the integers 1 and 0. 1 + 0 = 1

i. et us consider the integers 2 and 1. 2 + 1 = 3

i. et us consider the integers –6 and 4. –6 + 4 = –2

. . et us consider 3 and 2. 3 – 2 = 1

i. et us consider 4 and 1. 4 – 1 = 3

ii et us consider 5 and 7. 5 – 7 = –2

4. a. By commutative law a + b = b + a; (–27) + (–52) = (–52) + (–27)

b. By additive identity law a + 0 = 0 + a = a; (–27) + 0 = (–27)

c. By adding + 27 we get result 0; (–27) + 27 = 0

d. By using associative property; [(–27) + (–52)] + (100) = (–27) + [(–52) + 100]

5. a. i. Sum of the integers 5 and 3 = 5 + 3 = 8, which is more than 7

i. um of the in egers 1 and –1 = 1 + (–1) = 1 – 1 = 0

iii. Sum of the integers –6 and –3 = –9, which is smaller than –7

iv. Sum of the integers 1 and –6 = 1 – 6 = –5, which is smaller than 0

v. Sum of integers –6 and –4 = –6 – 4 = –10, which is the least sum of two integers which are given.

b. i. Let us take the integers –4 and –3.

–4 – (–3) = –4 + 3 = –1, which is greater than –4.

ii. Let us take the integers –3 and –1.

–3 – (–1) = –2, which is a negative integer.

iii. Let us take the integers 5 and –3.

5 – (–3) = 5 + 3 = 8, which is greater than 6.

iv. Let us take the integers 5 and –6.

5 – (–6) = 5 + 6 = 11, which is greater than 10.

v. Let us take the integers –6 and 5.

–6 – 5 = –11, which is the least difference between the pairs of integers.

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Exercise 1.3

Exercise 1.3

1. Find the following products.
   a. $(-36) \times 4$
   b. $375 \times (-1)$
   c. $(-52) \times (-40)$
   d. $(-171) \times (-5)$
   e. $(-15) \times (-3) \times (-8)$
   f. $(-3) \times (-4) \times (-1) \times (-8)$
   g. $27 \times (-29) \times 0 \times (-14) \times (-1)$
   h. $9 \times (-11) \times (6) \times (-1) \times (5)$

2. Verify the following:
   a. $22 \times [(-19) + 5] = 22 \times (-19) + 22 \times 5$
   b. $(-96) \times [(-12) + (-28)] = (-96) \times (-12) + (-96) \times (-28)$

3. Find out by which number (-1) should be multiplied to get the following products.
   a. 0 b. -1 c. 1 d. 15 e. -25

4. Using the properties of multiplication, find the following products.
   a. $(-153) \times 91 + 9 \times (-153)$
   b. $267 \times (-102) + 2 \times 267$
   c. $4 \times (-512) \times 25$
   d. $2 \times (-379) \times 50 \times (-10)$
   e. $(-102) \times 75$
   f. $1401 \times (-82) + (-1401) \times 18$
   g. $(-199) \times 25$
   h. $(-111) \times (-89) + 111$

5. Starting from $(-2) \times 3$, write the different products depicting definite patterns to verify that $(-2) \times (-2) = 4$.

6. Fill in the blanks to make the following statements true.
   a. $257 \times$ _____ $= (-257)$
   b. $918 \times$ _____ $= 0$
   c. $(-756) \times$ _____ $= 756$
   d. $(-30) \times$ _____ $= (-270)$
   e. _____ $\times (-21) = 105$
   f. $-56 \times [(-9) + (-1)] =$ _____

7. The price of a machine depreciates at the rate of ₹1500 per year. If it was bought for ₹15,800, what will be its price after 5 years?

8. A hot air balloon begins to descend towards the ground from a height of 2250 feet. If it descends at the rate of 150 feet per minute, find the height after 12 minutes.

9. In a competitive examination, 6 marks are awarded for every correct answer and 3 marks are deducted for every wrong answer and 0 mark is given for not answering a question. There are 12 questions for each candidate to answer.
   a. Sohail gets 7 correct answers and 5 wrong answers. Find his score.
   b. Mahi gets 4 correct answers and the remaining wrong. What is her score?
   c. Prithvi attempts only 10 questions and gets only 6 correct answers. What is his score?

10. A vegetable merchant gets a profit of ₹100 per bag on onions sold and a loss of ₹30 per bag on potatoes sold.
    a. If he sells 30 bags of onions and 50 bags of potatoes on a particular day, what is his profit or loss?
    b. Find his profit or loss if he sells 60 bags of potatoes and 30 bags of onions.
    c. Find the number of bags of onion he should sell to make no profit or loss, if he sold 40 bags of potatoes.

Solution-:

Exercise 1.3 (Page 12)

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1. a. $(-36) \times 4 = -144$ b. $375 \times (-1) = -375$

c. $(-52) \times (-40)$; Here, both are negative integers
$\therefore (-52) \times (-40) = +2080 = 2080$

d. $(-171) \times (-5)$; Here, both are negative integers and we know that '$- \times -$' gives '+' and $171 \times 5 = 855$; $\therefore (-171) \times (-5) = +855 = 855$

e. $(-15) \times (-3) \times (-8) = 45 \times (-8) = -360$

f. $(-3) \times (-4) \times (-1) \times (-8) = (+12) \times (+8) = 96$

g. $27 \times (-29) \times 0 \times (-14) \times (-1) = 0$; Here, the answer is '0' because when we multiply an integer by '0', we will get '0'.

h. $9 \times (-11) \times (6) \times (-1) \times 5 = -99 \times -6 \times 5 = 594 \times 5 = 2970$

2. a. LHS $= 22 \times [(-19) + 5] = 22 \times [-14] = -308$
RHS $= 22 \times (-19) + 22 \times 5 = -418 + 110 = -308$
$\therefore 22 \times [(-19) + 5] = 22 \times (-19) + 22 \times 5$

. HS = (–96) × [(–12) + (–28)] = (–96) × [–12 – 28] = (–96) × [–40] = 3840
HS = (–96) × (–12) + (–96) × (–28) = 1152 + 2688 = 3840
∴ (–96) × [(–12) + (–28)] = (–96) × (–12) + (–96) × (–28)

3. a. To get '0', (–1) should be multiplied by 0.
b. To get (–1), (–1) should be multiplied by 1.
c. To get 1, (–1) should be multiplied by (–1).
d. To get 15, (–1) should be multiplied by (–15).
e. To get (–25), (–1) should be multiplied by (25).

4. . –153) × 91 + 9 × (–153) = (–153) × 91 + (–153) × 9 = (–153) × [91 + 9]
–153 × 100 = –15300

. 67 × (–102) + 2 × 267 = 267 × (–102) + 267 × 2
= 267 × [(–102) + 2] = 267 × (–100) = –26700

. 4 × ((–512) × 25) = 4 × (25 × (–512)) = (4 × 25) × (–512) = 100 × (–512) = –51200

. × (–379) × 50 × (–10) = 2 × { –379) × (–500)} 2 × (–500) × (–379)
= (–1000) × (–379) = 3,79,000

. (–102) × 75; Now –102 = –100 – 2
∴ (–102) × 75 = (–100 – 2) × 75
= (–100 × 75) + (–2 × 75) = (–7500) + (–150) = –7500 – 150 = –7650

f. Since, –1401 = 1401 × (–1)
Then, 1401 × (–82) + (–1401) × 18 = 1401 × (–82) + (1401) × {(–1) × 18}
= 1401 × (–82) + 1401 × (–18) = 1401 × (–82 – 18) = 1401 × (–100) = –140100

g. Let us write –199 as (–200 + 1)
∴ (–199) × 25 = (–200 + 1) × 25 = (–200 × 25) + (1 × 25) = –5000 + 25 = –4975

h. (–111) × (–89) + 111; –111 = 111 × (–1) and 111 = 111 × 1
∴ (–111) × (–89) + 111 = (111 × –1) × (–89) + 111 × 1
111 × [–1 × (–89)] + 111 × 1 = 111 × 89 + 111 × 1
111 × (89 + 1) = 111 × 90 = 9990

5. Starting from (–2) × 3,
–2) × 3 = –6; (–2) × 2 = –4; (–2) × 1 = –2; (–2) × 0 = 0; (–2) × (–1) = 2
(–2) × (–2) = 4; Thus, (–2) × (–2) = 4 is verified by using the pattern.

6. a. 257 × (–1) = (–257) [To get the opposite of an integer, multiply by –1]

. 18 × _ = 0 (any integer multiplied by '0' gives '0')

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c. $(-756) \times -1 = 756$ [To get the opposite of an integer, multiply it by -1.]

. $-30) \times \underline{9} = -270$

To find the missing number, divide -270 by -30.

$-30 \times x = -270$; $x = \frac{\not{-270}}{\not{-30}} = 9 \therefore (-30) \times 9 = -270$

. e x be the missing number. Thus, $x \times (-21) = 105$

To find x; divide 105 by -21; $\therefore x = \frac{105}{-21} = -5$; So, $(-5) \times (-21) = 105$

f. $-56 \times [(-9) + (-1)] = -56 \times [-10] = 560$

7. Initial cost of the machine = ₹ 5,800

ince the value of the machine depreciates at the rate of ₹ 500 per year.

For 5 years, the reduction in price is 5 × ₹ 500 = ₹ 500

So, after 5 years, the price of the machine = ₹ 5,800 – ₹ 7500 = ₹ ,300

8. Initial height of hot air balloon = 2250 feet

ince, it descends a the rate of 150 feet per minute.

o, in 12 minutes, it descends by (150 × 12) feet; 150 × 12 = 1800 feet

So, after 12 minutes, the height of the hot air balloon from the ground

= 2250 ft – 1800 ft = 450 ft

9. a. Marks given for each correct answer = 6 ∴ Marks for 7 correct answers = 7 × 6 = 42

Marks deducted for every wrong answer = 3

Marks deducted for 5 wrong answers = 5 × 3 = 15

Sohail's score = 42 – 15 = 27 marks

b. Mahi gets 4 correct answers.

∴ Marks for 4 correct answers = 4 × 6 = 24

Marks reduced for the remaining 8 wrong answers = 8 × 3 = 24

∴ Mahi's score = 24–24 = 0

c. Marks given for 6 correct answers = 6 × 6 = 36

Prithvi attempts 10 questions, ∴ He has 4 wrong answers.

Marks deduced for 4 wrong answers = 4 × 3 = 12

No marks will be reduced for not answering.

∴ Prithvi's score = 36 – 12 = 24

10. a. Profit on selling 30 bags of onions = 30 × ₹ 00 = ₹ 000

oss on selling 50 bags of pot toes = 50 × ₹ 0 = ₹ 500

Profit (₹ 000) > Loss (₹ 500)

∴ He gets a profit of ₹ 000 – ₹ 500 = ₹ 500

. oss on selling 60 bags of pot toes = 60 × ₹ 0 = ₹ 800

Profit on selling 30 bags of onions = 30 × ₹ 00 = ₹ 000

Profit (₹ 000) > Loss (₹ 800)

∴ He gets a profit of ₹ 000 – ₹ 800 = ₹ ,200

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. oss on selling 40 bags of pot toes = 40 × ₹ 0 = ₹ 200
oss of ₹ 1200 in sale of potatoes = Profit of ₹ 200 in sale of onions

∴ Number of bags of onions sold = $\frac{\text{Loss on 40 bags of potatoes}}{\text{Loss per bag on onions}} = \frac{₹\,1200}{₹\,100} = 12$

Exercise 1.4

Exercise 1.4

1. Find the quotient.
   a. $18 \div (-3)$
   b. $(-98) \div (-7)$
   c. $(-126) \div (-42)$
   d. $0 \div (-86)$
   e. $102 \div (-17)$
   f. $(-72) \div 36$
2. Evaluate each of the following:
   a. $(-52) \div (-26)$
   b. $(-38) \div [(-19) + (-19)]$
   c. $(-49) \div [(-7) \times 7]$
   d. $(-101) \div [(-99) + 98]$
   e. $117 \div [2 + (-1)]$
   f. $[(-8) \times (-7)] \div [(-10) + (-4)]$
   g. $(-81) \div [(-27) \div 3]$
   h. $[(-120) \div 40] \div (-3)$
3. Fill in the blanks.
   a. $(-157) \div$ _____ $= 157$
   b. $(-139) \div$ _____ $= 1$
   c. _____ $\div 149 = 0$
   d. $272 \div$ _____ $= (-1)$
   e. _____ $\div (-3) = 4$
   f. $(-27) \div$ _____ $= 3$
4. Verify that
   $(-48) \div [12 \div (-4)] \neq [(-48) \div 12] \div (-4)$.
5. Verify the following:
   a. $(-24) \div [(-8) + 6] \neq (-24) \div (-8) + (-24) \div 6$
   b. $(-100) \div [(-4 + 2)] \neq [(-100) \div (-4)] + [(-100) \div 2]$
6. Write down 4 pairs of integers a and b such that $a \div b = -5$.
7. The temperature of a mixture decreases at the rate of 1 °C per 30 minutes. The temperature of the mixture at 3 o'clock was 5 °C.
   a. At what time will the temperature be 3 °C below zero?
   b. What will be the temperature of the mixture at 6 o'clock?
8. In a competitive examination, 5 marks are awarded for every correct answer and 3 marks are deducted for every wrong answer. Atul scored 35 marks when 10 of his answers were correct. Subodh answered eight questions correctly and his score was 19. Find the number of questions answered wrongly by both of them.
9. Simplify.
   a. $24 - 42 \div 6 \times 5 + 3 - 10$
   b. $77 \div 11 + 2 \times 5 - 30$
10. Simplify the following using BODMAS rule.
    a. $[\{10 - (24 \div \overline{6 - 8} \times 3)\} + (2 - 10)]$
    b. $[\{14 + \overline{8 - 11} - (45 \div 9 \times 3)\} - 100]$

Solution-:

Exercise 1.4 (Page 15)

1. a. $8 \div (-3) = \frac{\cancel{18}^{6}}{\cancel{-3}_{1}} = -6$

b. $(-98) \div (-7) = \frac{-98}{-7} = 14$ ($\because 7 \times 14 = 98$)

. $-126) \div (-42) = \frac{-126}{-42} = 3$ ($\because 42 \times 3 = 126$)

. $\div (-86) = 0$ ($\because$ When '0' is divided by any integer, it gives '0' as the result)

. $02 \div (-17) = \frac{102}{17} = -6$ ($\because 7 \times 6 = 102$)

f $-72) \div 36 = \frac{-72}{36} = -2$ ($\because 36 \times 2 = 72$)

2. Applying BODMAS to evaluate the following.

. $-52) \div (-26) = \frac{-52}{-26} = 2$ ($\because 26 \times 2 = 52$)

b. $(-38) \div [(-19) + (-19)] = (-38) \div [(-19) - 19] = (-38) \div [-38] = 1$
$\therefore (-38) \div [(-19) + (-19)] = 1$

c. $(-49) \div [(-7) \times 7] = (-49) \div [-49] = 1$

d. $(-101) \div [(-99) + 98] = (-101) \div [-1] = 101$

. $17 \div [2 + (-1)] = 117 \div [2 - 1] = 117 \div 1 = 117$

f $(-8) \times (-7)] \div [(-10) + (-4)] = 56 \div [(-10) - 4] = 56 \div [-14] = -4$

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. $-81) \div [(-27) \div 3] = (-81) \div (-9) = 9$

. $(-120) \div 40] \div (-3) = [-3] \div (-3) = 1$

3. . $-157)\ \underline{\ -1\ } = 157$; To get the opposite of a number, divide the given number by -1.

. $-139) \div \underline{(-139)} = 1$; Dividing a number by itself gives 1.

. $\_ \div 149 = 0$; Dividing '0' by any number gives '0'.

. $72\ \underline{(-272)} = (-1)$; Dividing a positive integer by its negative integer gives (-1) and he opposite of 272 is -272.

. $\underline{-12} \div (-3) = 4$; Let x be the missing number.

$$\therefore x \div (-3) = 4 \Rightarrow \frac{x}{-3} = 4 \Rightarrow x = 4 \times (-3) \therefore x = -12$$

. $-27) \div \underline{-9} = 3$; Let x be the missing number.

$$\therefore (-27) \div x = 3 \Rightarrow \frac{-27}{x} = 3 \Rightarrow -27 = 3 \times x \Rightarrow x = \frac{-27}{3} = -8$$

4. **HS:** $-48) \div [12 \div (-4)] = (-48) \div (-3) = \frac{-48}{-3} = 16$

HS: $(-48) \div 12] \div (-4) = (-4) \div (-4) = 1$

So, LHS ≠ RHS $\Rightarrow (-48) \div [12 \div (-4)] \neq [(-48) \div 12] \div (-4)$; Hence, verified.

5. . **HS:** $(-24) \div [(-8) + 6] = (-24) \div (-2) = 12$

HS: $(-24) \div (-8) + (-24) \div 6 = 3 + (-4) = 3 - 4 = -1$

$\Rightarrow$ LHS ≠ RHS

$\therefore (-24) \div [(-8) + 6] \neq (-24) \div (-8) + (-24) \div 6$; Hence, verified.

. **HS:** $(-100) \div [(-4 + 2)] = (-100) \div [-2] = 50$

HS: $[(-100) \div (-4) + [(-100 \div 2)] = 25 + (-50) = 25 - 50 = -25$

$\therefore$ LHS ≠ RHS

$\Rightarrow (-100) \div [(-4 + 2)] \neq [(-100) \div (-4)] + [(-100 \div 2)]$; Hence, verified.

6. Let a = 5, b = −1 $\therefore 5 \div (-1) = -5$; Let a = −5, b = 1 $\therefore (-5) \div 1 = -5$

Let a = −10, b = 2 $\therefore (-10) \div 2 = -5$; Let a = 10, b = −2 $\therefore (10) \div (-2) = -5$

7. . n 30 minutes, the t mperature decreases by 1°C.

$\therefore$ In 1 hour, the temperature decreases by 2°C.

The temperature at 3'o clock = 5°C.

Temperature reached 3°C below zero = −3°C

ecrease in temperature = −3°C − 5°C = −8°C

ecreasing rate of temperature for 1 hour = −2°C

$\therefore$ Time taken to reach −3°C from 5°C = $\frac{-8}{-2} = 4$ hours

$\therefore$ After 4 hours, the time will be 7'o clock.

$\therefore$ At 7'o clock, the temperature of the mixture is −3°C.

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. f at 7'o clock the temperature is –3°C, then at 6'o clock, the temperature would be –1°C.
The temperature decreases at the rate of 2°C per hour.
∴ Temperature at 6'o clock = –3°C + 2°C = –1°C

8. . arks awarded to Atul for 10 correct answers = 10 × 5 = 50
iven Atul's score = 35
∴ Marks deducted for wrong answers = 35 – 50 = –15
arks deducted for each wrong answer = –3

∴ Number of wrong answers = $\frac{-15}{-3} = 5$ Thus, Atul gave 5 wrong answers.

i. ubodh's mark for 8 correct answers = 8 × 5 = 40
iven Subodh's score = 19
∴ Marks deducted for wrong answers = 19 – 40 = –21
arks reduced for 1 wrong answer = –3

∴ Number of wrong answers = $\frac{-21}{-3} = 7$

9. . 24 – 42 ÷ 6 × 5 + 3 – 10 = 24 – 7 × 5 + 3 – 10 = 24 – 35 + 3 – 10
24 – 32 – 10 = 24 – 42 = –18

. 7 ÷ 11 + 2 × – 30 = 7 + 2 × 5 – 30 = 7 + 10 – 30 = 17 – 30 = –13

10. . {10 – (24 ÷ $\overline{6-8}$ × 3) + (2 – 10)] = [{10 – (24 ÷ (–2) × 3)} + (2 – 10)]
= [{10 – (–12 × 3)} + (–8)] = [{10 – (–36)} + (–8)]
[{10 36} + (–8)] = [46 + (–8)] = 46 – 8 = 38

. {14 + $\overline{8-11}$ – (45 ÷ 9 × 3)} – 100]
pply BODMAS,
= [{14 + (–3) – (5 × 3)} –100] = [{14 + (–3) – 15} – 100]
= [{14 – 3 – 15} – 100] = [{14 – 18} – 100] = [–4 – 100] = –104

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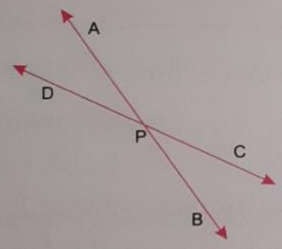
CHAPTER-10
LINES AND ANGLES

EXERCISE 10.1

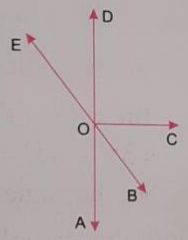
Exercise 10.1

1. Find the complement of the following angles.
   a. 67° b. 49° c. 55°
   d. 18° e. 26°
2. Find the supplement of the following angles.
   a. 126° b. 38° c. 109°
   d. 11° e. 74°
3. Which of the following pairs of angles are complementary and which are supplementary?
   a. 72°, 18° b. 108°, 72° c. 67°, 113°
   d. 87°, 3° e. 23°, 67° f. 111°, 69°
4. Name all the adjacent angles and linear pairs in the following diagrams.

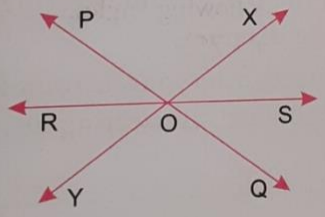
a.



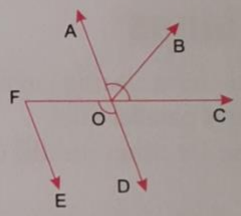
b.



5. How many pairs of vertically opposite angles are there in the diagram? Name them.



6. Fill in the blanks.
   a. The supplement of an acute angle is an _____ angle.
   b. The complement of an acute angle is an _____ angle.
   c. The supplement of an obtuse angle is an _____ angle.
   d. The supplement of a right angle is a _____ angle.
   e. If two lines ℓ_1 and ℓ_2 intersect at a point O in such a way that one pair of vertically opposite angles are obtuse, then the other pair of vertically opposite angles are _____.
   f. The number of linear pairs formed where two lines intersect at a point is _____.
7. With reference to the given diagram, state whether the following statements are true or false.

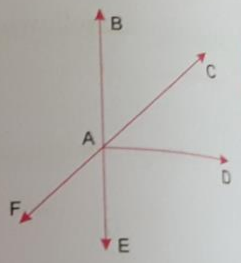


   a. ∠AOB and ∠BOD are adjacent angles.
   b. ∠AOF and ∠EFO are adjacent angles.
   c. ∠FOD and ∠AOC are vertically opposite angles.
   d. ∠AOB and ∠BOD form a linear pair.
   e. ∠AOF and ∠DOF are not adjacent angles.

vertically opposite angles are equal)
So, $x = 15° + 85° = 100°$

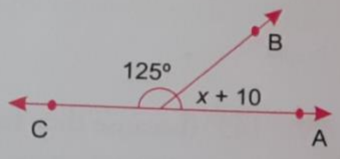
8. With reference to the given diagram, match the following:

a. adjacent and complementary angles	i. ∠DAC and ∠EAD
b. obtuse and vertically opposite angles	ii. ∠BAC and ∠EAF
c. adjacent but not supplementary angles	iii. ∠BAC and ∠CAD
d. acute and vertically opposite angles	iv. ∠CAB and ∠BAF
e. a linear pair	v. ∠BAF and ∠CAE

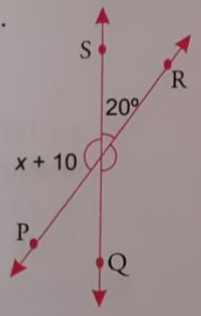


9. Find the value of x in each of the following figures.

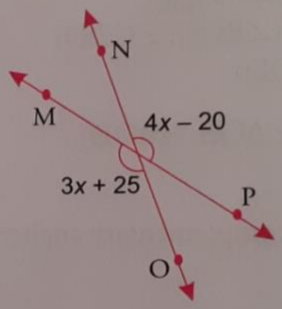
a.



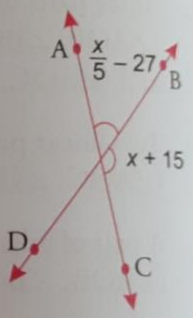
b.



c.

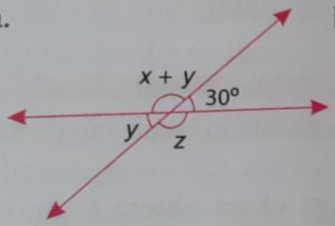


d.

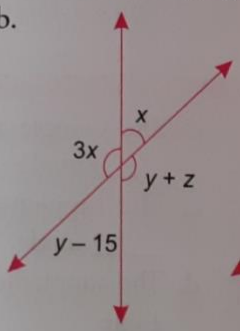


10. Find the values of x, y and z in the following figures.

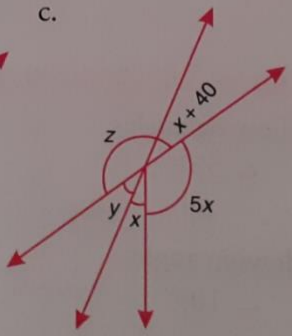
a.



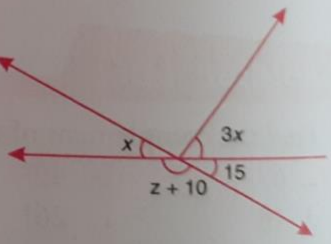
b.



c.



d.



SOLUTIONS-:

Exercise 10.1 (Page 143)

1. a. The complement of $67° = 90° - 67° = 23°$
   b. The complement of $49° = 90° - 49° = 41°$
   c. The complement of $55° = 90° - 55° = 35°$
   d. The complement of $18° = 90° - 18° = 72°$
   e. The complement of $26° = 90° - 26° = 64°$

2. a. The supplement of $126° = 180° - 126° = 54°$
b. The supplement of $38° = 180° - 38° = 142°$
c. The supplement of $109° = 180° - 109° = 71°$
d. The supplement of $11° = 180° - 11° = 169°$
e. The supplement of $74° = 180° - 74° = 106°$

3. . 2°, 18°; d. 87°, 3°; e. 23°, 67° are complementary
b. 108°, 72° c. 67°, 113° f . 111°, 69° are supplementary

4. . Adjacent angles: 1. ∠DPA, ∠APC; 2. ∠APC, ∠CPB; 3. ∠CPB, ∠BPD;
. ∠BPD, ∠DPA
Linear Pairs: ∠DPA, ∠APC; ∠APC, ∠CPB; ∠CPB, ∠BPD; ∠BPD, ∠DPA
b. Adjacent angles: ∠EOD, ∠DOC; ∠DOC, ∠COB; ∠COB, ∠BOA ∠BOA, ∠AOE ∠AOE, ∠EOD
Linear Pairs: ∠EOD, ∠DOB; ∠DOC, ∠AOC; ∠AOE, ∠EOD; ∠EOC, ∠BOC

5. Vertically opposite angles: 6 pairs
∠XOQ and ∠POY, ∠YOQ and ∠POX, ∠POR and ∠QOS, ∠ROY and ∠XOS, ∠XOR and ∠SOY, ∠POS and ∠ROQ

6. . obtuse b. acute c. acute d. right e. acute f. 4

7. . ∠AOB and ∠BOD are adjacent angles. True
They have a common vertex O, a common arm OB and the non-common arms are on opposite sides of the common arm.
b. ∠AOF and ∠EFO are adjacent angles. False
They do not have a common vertex.
c. ∠FOD and ∠AOC are vertically opposite angles. True — AD and CF intersect at O.
d. ∠AOB and ∠BOD are linear pair. True — They are on the same line AD.
e. ∠AOF and ∠DOF are not adjacent angles. False
They are adjacent angles. They have a common vertex O, a common arm OF and the non-common arms are on opposite sides of the common arm.

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8.

a. adjacent and complementary angles	iii. ∠BAC and ∠CAD
b. obtuse and vertically opposite angles	v. ∠BAF and ∠CAE
c. adjacent but not supplementary angles	ii. ∠BAC and ∠EAF
d. acute and vertically opposite angles	i. ∠DAC and ∠EAD
e. a linear pair	iv. ∠CAB and ∠BAF

9. a. $125° + (x + 10°) = 180°$ (Linear pair)
$x + 135° = 180°$
$x = 180° - 135°$
$x = 45°$

b. $x + 10° + 20° = 180°$ (Linear pair)
$\Rightarrow x + 30° = 180°$
$\Rightarrow x = 150°$

c. Vertically opposite angles are equal.
So, $4x - 20 = 3x + 25 \Rightarrow 4x - 3x = 25 + 20 \Rightarrow x = 45°$

$\cdot \left(\frac{x}{5}-27\right)+(x+15)=180$ Linear pair)

$\Rightarrow \frac{x}{5}+x-27+15=180 \Rightarrow \frac{6x}{5}-12=180 \Rightarrow \frac{6x}{5}=180+12=192$

$\Rightarrow x=\frac{192\times 5}{6}=32\times 5=160$

10. a. Vertically opposite angles are equal. So, $y = 30°$ and $z = x + y$

$x + y + 30 + z + y = 360° \Rightarrow x + y + 30 + x + y + 30 = 360°$

$30° + 30° + 2x + 2y = 360° \Rightarrow 30° + 30° + 2x + 2\,(30) = 360$

$2x + 60° + 60° = 360° \Rightarrow 2x = 360° - 120° \Rightarrow 2x = 240°$

$\Rightarrow x = 120°; y = 30°; z = x + y = 120° + 30° = 150°$

b. $y + z = 3x$ and $x = y - 15$ (vertically opposite angles)

$x + y + z + y - 15 + 3x = 360°$

$x + 3x + x + 3x = 360° \Rightarrow 8x = 360° \Rightarrow x = \frac{360°}{8} \Rightarrow x = 45°$

$y = x + 15 \Rightarrow y = 45° + 15° \Rightarrow y = 60°$

$z = 3x - y = 3(45°) - 60° \Rightarrow z = 135° - 60° \Rightarrow z = 75°$

c. $z + y + x + 5x + x + 40 = 360°$ and $y = x + 40$; $z = x + 5x = 6x$

$z + y + x + 5x + x + 40 = 360° \Rightarrow 6x + x + 40 + x + 5x + x + 40 = 360°$

$14x + 80 = 360° \Rightarrow 14x = 360° - 80° \Rightarrow 14x = 280°$

$x = \frac{280°}{14} \Rightarrow x = 20° \Rightarrow y = x + 40° = 20° + 40° \Rightarrow y = 60°$

$z = 6x = 6(20°) = 120°$

d. $x + z + 10 + 15 + z + 10 = 360°$,

$\therefore x + 2z + 35 = 360°$ and $x = 15°$

Let the missing angle be y and $z + 10 = y + 3x$.

$15° + 2z + 35° = 360° \Rightarrow 2z = 360° - 50° = 310° \Rightarrow z = \frac{310°}{2} \Rightarrow z = 155°$

$x = 15° \Rightarrow z + 10 = y + 3x \Rightarrow 155° + 10 = y + 45°$

$y = 165° - 45° \Rightarrow y = 120°$

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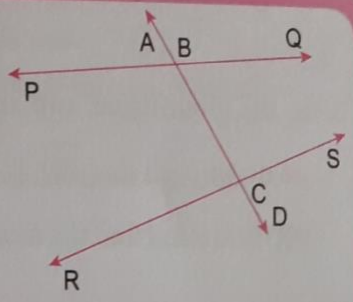
EXERCISE 10.2

Exercise 10.2

1. With reference to the given diagram, match the following:

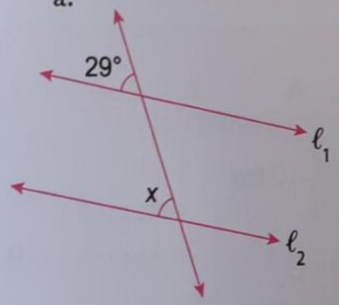
   a. The angle forming a linear pair with ∠ABP
   b. The angle alternate to ∠RCB
   c. The angle corresponding to ∠DCR
   d. The angle vertically opposite to ∠QBC
   e. _____ and ∠QBC form a pair of co-interior angles

   i. ∠QBC
   ii. ∠ABP
   iii. ∠ABQ
   iv. ∠SCB
   v. ∠CBP

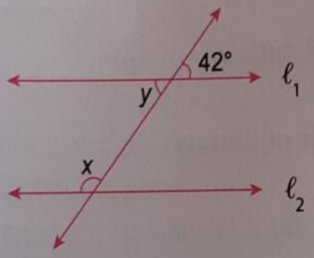


2. Given that $\ell_1 \parallel \ell_2$, find the measures of the angles x and y.

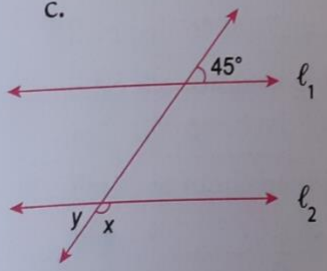
a.



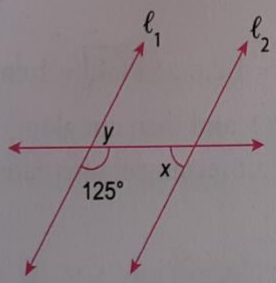
b.



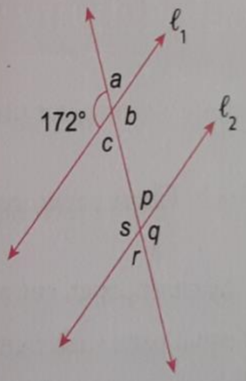
c.



d.

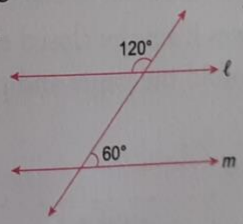


3. If $\ell_1 \parallel \ell_2$ in the figure, find the angles a, b, c, p, q, r and s.

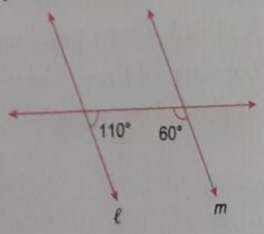


4. Check whether $\ell \parallel m$ in each of the following figures. Give reasons for your answer.

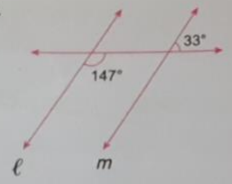
a.



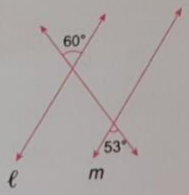
b.



c.

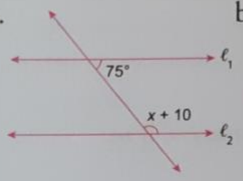


d.

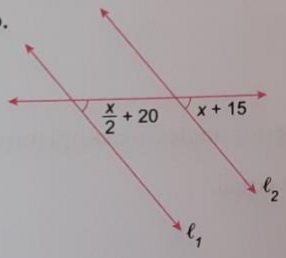


5. If ℓ_1 is parallel to ℓ_2, find the value of x in the following cases.

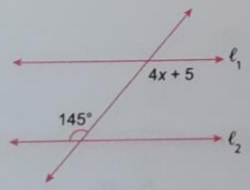
a.



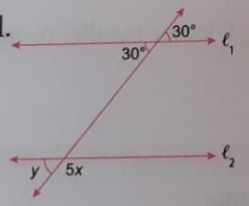
b.



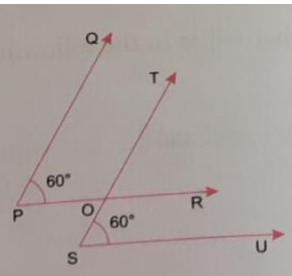
c.



d.



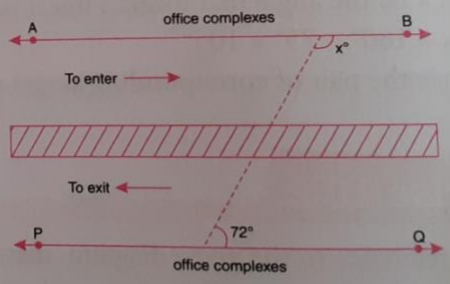
6. In the given figure, two angles measuring 60° are drawn such that $\overrightarrow{PQ} \parallel \overrightarrow{ST}$. Check whether $\overrightarrow{PR} \parallel \overrightarrow{SU}$ and find the measure of $\angle TOR$.



VBL-S

In an IT park, the municipal corporation planned to construct a divider on a road to reduce the number of accidents and make the traffic smooth.

In the given diagram, $\overline{AB}$ and $\overline{PQ}$ represent the two parallel edges of the road that is constructed for the entry and exit points to the IT park. The divider is in the middle of the road.



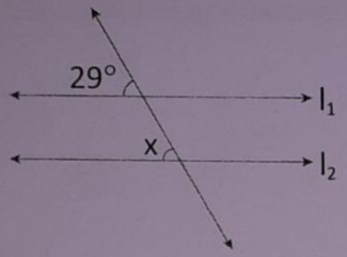
a. With reference to the diagram, find the value of x.
b. Give reasons why dividers are essential.
c. Write five sentences on the importance of decision-making skills.

SOLUTIONS-:

Exercise 10.2 (Page 149)

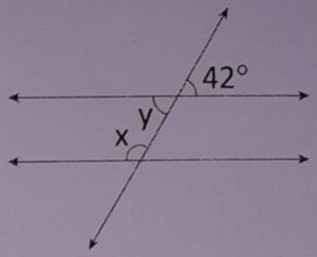
1. a → iii b → i c → v d → ii e → iv

2. .



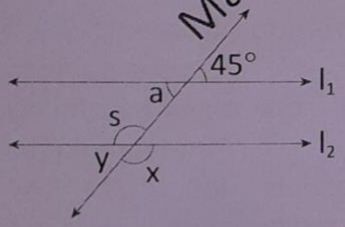
x = 29° (corresponding angles)

b.



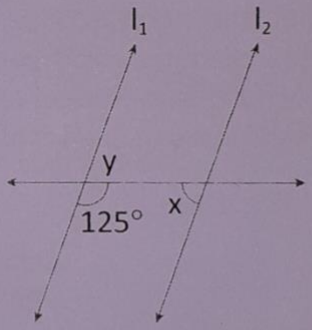
y = 42° (vertically opposite angles)
co-interior angles are supplementary
$\therefore x + y = 180° \Rightarrow x = 180° - 42° = 138°$

c.



= 45° (vertically opposite angles)
y = a (corresponding angles)
Then, y = 45°
Co-interior angles are supplementary
$a + s = 180° \Rightarrow s = 180° - 45° = 135°$
$\therefore$ x = 135° (vertically opposite angles are equal)

d.



x = 180° − 125° = 55° (linear pair)
x = y, then y = 55° (alternate interior angles are equal)

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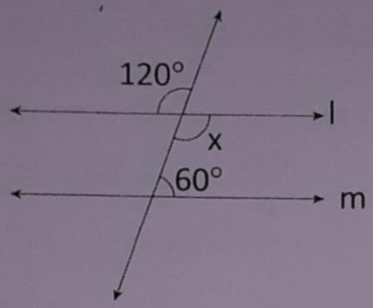
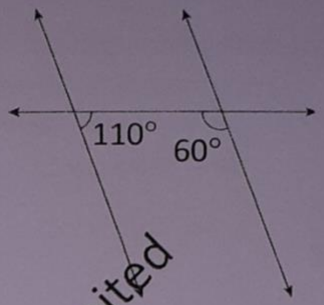
3. b = 172° (vertically opposite angles are equal)
p = 180° – 172° = 8° (co-interior angles are supplementary)
s = b, then s = 172° (alternate interior angles are equal)
c = 180° – 172° = 8° (linear pair)
r = 8° (p and r are vertically opposite angles which are equal)
q = 172° (s and q are vertically opposite angles which are equal)
a = 8° (a and c are vertically opposite angles which are equal)

4. .



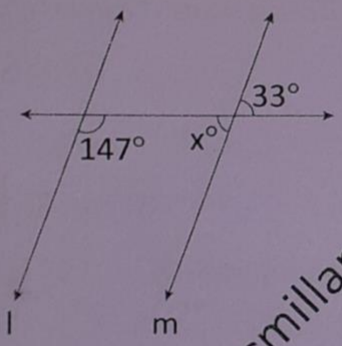
x = 120° (vertically opposite angles)
Co-interior angles 120° + 60° = 180° are supplementary angles, so the lines l and m are parallel.

b.



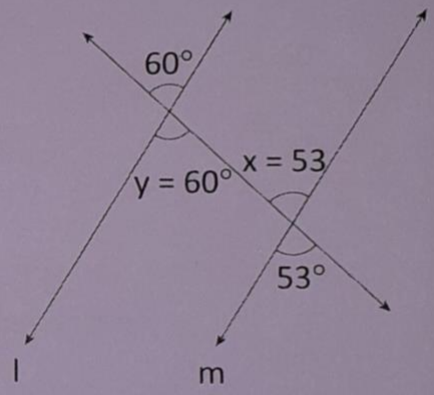
Co-interior angles 110° + 60° = 170° are not supplementary. So, the lines l and m are not parallel.

c.



x = 33° (vertically opposite angles are equal)
Co-interior angles are supplementary
147° + 33° = 180°. Hence the lines l and m are parallel.

d.



x = 53° (vertically opposite angles are equal)
y = 60° (vertically opposite angles are equal)
Alternate interior angles x ≠ y.
So the lines l and m are not parallel.

5. a. For parallel lines, co-interior angles are supplementary.
So, $x + 10 + 75 = 180 \Rightarrow x + 85 = 180 \Rightarrow x = 180 - 85 \Rightarrow x = 95^\circ$

b. For parallel lines, corresponding angles are equal.

So, $\frac{x}{2} + 20 = x + 15 \Rightarrow \frac{x}{2} = x + 15 - 20$

$\Rightarrow \frac{x}{2} = x - 5 \Rightarrow x = 2x - 10 \Rightarrow 2x - x = 10^\circ \Rightarrow x = 10^\circ$

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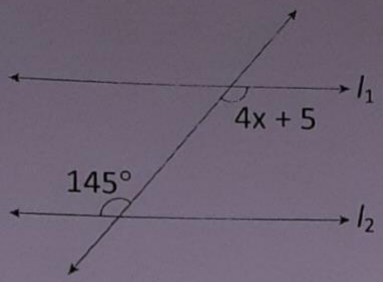
c.



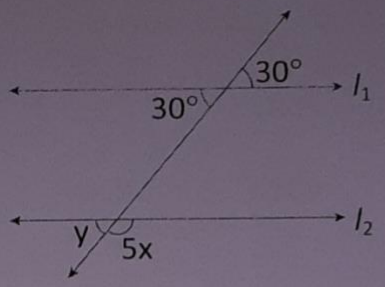
For parallel lines, alternate interior angles are equal.

$4x + 5 = 145 \Rightarrow 4x = 145 - 5$

$4x = 140 \Rightarrow x = \frac{140^\circ}{4}$

$\Rightarrow x = 35^\circ$

d.



$y = 30^\circ$ (corresponding angles are equal)

$5x + y = 180^\circ$ (linear pair)

$\therefore 5x + 30^\circ = 180$

$5x = 180^\circ - 30^\circ$

$5x = 150^\circ \Rightarrow x = \frac{150^\circ}{5} \Rightarrow x = 30^\circ$

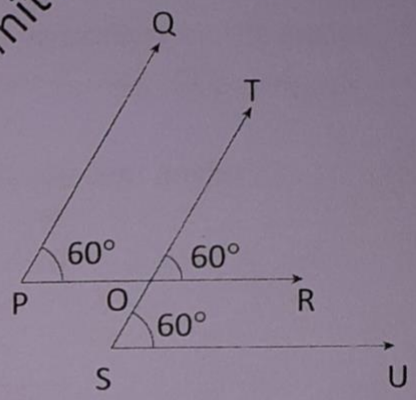
6. $\overrightarrow{PQ} \| \overrightarrow{ST}$ and PR is the transversal

$\therefore \angle QPR = \angle TOR = 60^\circ$ (corresponding angles)

$\therefore \angle TOR = \angle TSU = 60^\circ$

These are corresponding angles formed by PR and SU with transversal TS

$\therefore \overrightarrow{PR} \| \overrightarrow{SU}$



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VBLS (Page 150)

a. x, 72° are co-interior angles.

$x = 180^\circ - 72^\circ = 108^\circ$ (co-interior angles are supplementary)

HOTS (Page 151)

a. Given that $\overline{AB} \| \overline{PQ}$

Alternate interior angles are equal $\therefore \angle Q \quad \angle A = 40^\circ$

and $\angle B \quad \angle P = 70^\circ$

Sum of the angles of a triangle = 180°

$\angle P + \angle Q + \angle PCQ = 180^\circ$

$70^\circ + 40^\circ + \angle PCQ = 180^\circ$

$\angle PCQ = 180^\circ - 110^\circ$

$\angle PCQ = 70^\circ$

Vertically opposite angles are equal $\therefore \angle ACB = 70^\circ$