EXERCISE 11D

Divide:

(i) – 16ab^{2}c by 6abc
(ii) 25x^{2}y by – 5y^2
(iii) 8x + 24 by 4
(iv) 4a^2 – a by – a
(v) 8m – 16 by – 8
Solution:

(i) – 16ab^{2}c by 6abc
We can write it as
= – 16ab^{2}c/ 6abc
= -8/3 b

(ii) 25x^{2}y by – 5y^2
We can write it as
= 25x^{2}y/ -5y^2
= -5 x^2/y

(iii) 8x + 24 by 4
We can write it as
= (8x + 24)/4
Separating the terms
= 8x/4 + 24/4
= 2x + 6

(iv) 4a^2 – a by – a
We can write it as
= (4a^2 – a)/ -a
Separating the terms
= 4a^2/-a – a/-a
= - 4a + 1

(v) 8m – 16 by – 8
We can write it as
= (8m – 16)/ -8
Separating the terms
= 8m/-8 – 16/-8
= - m + 2

2. Divide:
(i) n^2 – 2n + 1 by n – 1
(ii) m^2 – 2mn + n^2 by m – n
(iii) 4a^2 + 4a + 1 by 2a + 1
(iv) p^2 + 4p + 4 by p + 2
(v) x^2 + 4xy + 4y^2 by x + 2y
Solution:

(i) n^2 – 2n + 1 by n – 1

$$
\begin{array}{r|l}
 & n - 1 \\
\hline
n - 1 & n^2 - 2n + 1 \\
 & n^2 - n \\
\hline
 & -n + 1 \\
 & -n + 1 \\
\hline
 & 0
\end{array}
$$

$n^2 – 2n + 1$ by $n – 1 = n – 1$

(ii) $m^2 – 2mn + n^2$ by $m – n$

$$
\begin{array}{r|l}
 & m - n \\
\hline
m - n & m^2 - 2mn + n^2 \\
 & m^2 - mn \\
\hline
 & -mn + n^2 \\
 & -mn + n^2 \\
\hline
 & 0
\end{array}
$$

$m^2 – 2mn + n^2$ by $m – n = m - n$

(iii) $4a^2 + 4a + 1$ by $2a + 1$

$$
\begin{array}{r|l}
 & 2a + 1 \\
\hline
2a + 1 & 4a^2 + 4a + 1 \\
 & 4a^2 + 2a \\
\hline
 & 2a + 1 \\
 & 2a + 1 \\
\hline
 & 0
\end{array}
$$

$4a^2 + 4a + 1$ by $2a + 1 = 2a + 1$

(iv) $p^2 + 4p + 4$ by $p + 2$

$$
\begin{array}{r|l}
 & p + 2 \\
\hline
p + 2 & p^2 + 4p + 4 \\
 & p^2 + 2p \\
\hline
 & 2p + 4 \\
 & 2p + 4 \\
\hline
 & 0
\end{array}
$$

$p^2 + 4p + 4$ by $p + 2 = p + 2$

(v) $x^2 + 4xy + 4y^2$ by $x + 2y$

$$
\begin{array}{r|l}
 & x + 2y \\
\hline
x + 2y & x^2 + 4xy + 4y^2 \\
 & x^2 + 2xy \\
\hline
 & 2xy + 4y^2 \\
 & 2xy + 4y^2 \\
\hline
 & 0
\end{array}
$$

$x^2 + 4xy + 4y^2$ by $x + 2y = x + 2y$

3. The area of a rectangle is $6x^2 – 4xy – 10y^2$ square unit and its length is $2x + 2y$ unit. Find its breadth.
Solution:

It is given that
Area of a rectangle = $6x^2 – 4xy – 10y^2$ square unit
Length = $2x + 2y$ unit
We know that
Breadth = Area/ Length
So we get
= $(6x^2 – 4xy – 10y^2)/ (2x + 2y)$
= $3x – 5y$ units

$$
\begin{array}{r|l}
 & 3x - 5y \\
\hline
2x + 2y & 6x^2 - 4xy - 10y^2 \\
 & 6x^2 + 6xy \\
\hline
 & - 10xy - 10y^2 \\
 & - 10xy - 10y^2 \\
\hline
 & 0
\end{array}
$$

4. The area of a rectangular field is $25x^2 + 20xy + 3y^2$ square unit. If its length is $5x + 3y$ unit, find its breadth. Hence, find its perimeter.
Solution:

It is given that
Area of a rectangular field = $25x^2 + 20xy + 3y^2$ square unit
Length = $5x + 3y$ unit
We know that
Breadth = Area/ Length
So we get
= $(25x^2 + 20xy + 3y^2)/ (5x + 3y)$
= $5x + y$ units

$$
\begin{array}{r|l}
 & 5x + y \\
\hline
5x + 3y & 25x^2 + 20xy + 3y^2 \\
 & 25x^2 + 15xy \\
\hline
 & 5xy + 3y^2 \\
 & 5xy + 3y^2 \\
\hline
 & 0
\end{array}
$$

Now the perimeter of the rectangular field = 2 (length + breadth)
Substituting the values
= 2 (5x + 3y + 5x + y)
So we get
= 2 (10x + 4y)
= 20x + 8y

5. Divide:
(i) $2m^3n^5$ by – mn
(ii) $5x^2 – 3x$ by x
(iii) $10x^3y – 9xy^2 – 4x^2y^2$ by xy
(iv) $3y^3 – 9ay^2 – 6ab^2y$ by – 3y
(v) $x^5 – 15x^4 – 10x^2$ by $– 5x^2$
Solution:

(i) $2m^3n^5$ by – mn
It can be written as
= $2m^3n^5$/ -mn
= $-2m^2n^4$

(ii) $5x^2 – 3x$ by x
It can be written as
= $(5x^2 – 3x)$/ x
Separating the terms
= $5x^2/x – 3x/x$
= 5x – 3

(iii) $10x^3y – 9xy^2 – 4x^2y^2$ by xy
It can be written as
= $(10x^3y – 9xy^2 – 4x^2y^2)$/ xy
Separating the terms
= $10x^3y/xy – 9xy^2/xy – 4x^2y^2/xy$
= $10x^2 – 9y – 4xy$

(iv) $3y^3 – 9ay^2 – 6ab^2y$ by – 3y
It can be written as
= $(3y^3 – 9ay^2 – 6ab^2y)$/ -3y
Separating the terms
= $3y^3$/-3y – $9ay^2$/-3y – $6ab^2y$/ -3y
= $-y^2 + 3ay^2 + 2ab^2$

(v) $x^5 – 15x^4 – 10x^2$ by $– 5x^2$
It can be written as
= $(x^5 – 15x^4 – 10x^2)$/ $-5x^2$
Separating the terms
= $x^5/-5x^2 – 15x^4/-5x^2 – 10x^2/-5x^2$
= $-1/5x^3 + 3x^2 + 2$