REVIEW EXERCISE

1. Four options are given against each statement. Encircle the correct option.

1. The factorization of $12x+36$ is:

(a) $12(x+3)$ (b) $12(3x)$

(c) $12(3x+1)$ (d) $x(12+36x)$

2. The factors of $4x^2-12y+9$ **are:**

(a) $(2x+3)^2$ (b) $(2x-3)^2$

(c) $(2x-3)(2x+3)$

(d) $(2+3x)(2-3x)^2$

3. The HCF of a^3b^3 **and** ab^2 **is:**

(a) a^3b^3 (b) ab^2

(c) a^4b^5 (d) a^2b

4. The LCM of $16x^2, 4x$ **and** $30xy$ **is:**

(a) $480x^3y$ (b) $240xy$

(c) $240x^2y$ (d) $120x^4y$

5. Product of LCM and HCF = _____ of two polynomials

(a) Sum (b) Difference

(c) Product (d) Quotient

6. The square root of x^2-6x+9 **is:**

(a) $\pm(x-3)$ (b) $\pm(x+3)$

(c) $x-3$ (d) $x+3$

7. The LCM of $(a-b)^2$ **and** $(a-b)^4$ **is:**

(a) $(a-b)^2$ (b) $(a-b)^3$

(c) $(a-b)^4$ (d) $(a-b)^6$

8. Factorization of x^3+3x^2+3x+1 is:

(a) $(x+1)^3$ (b) $(x-1)^3$

(c) $(x+1)(x^2+x+1)$

(d) $(x-1)(x^2-x+1)$

9. Cubic polynomials has degree

(a) 1 (b) 2

(c) 3 (d) 4

10. One of the factors of x^3-27 **is:**

(a) $x-3$

(b) $x+3$

(c) x^2-3x+9

(d) Both (a) and (c)

Answer Key

1	a	**2**	b	**3**	b	**4**	c	**5**	c
6	a	**7**	c	**8**	a	**9**	c	**10**	a

11. Factorize the following expressions:

1. $4x^3+18x^2-12x$

Ans:

$=2x(2x^2+9x-6)$

2. x^3+64y^3

Ans:

$=x^3+(4y)^3$

$=(x+4y)(x^2-4xy+16y^2)$

3. x^3y^3-8

Ans:

$(xy)^3-2^3$

$(xy-2)(x^2y^2+2xy+4)$

4. $-x^2-23x-60$

Ans:

$=-(x^2+23x+60)$

$=-[x^2+20x+3x+60]$

$=-[x(x+20)+3(x+20)]$

$=-(x+20)(x+3)$

5. $2x^2+7x+3$

Ans:

$=2x^2+6x+1x+3$

$=2x(x+3)+1(x+3)$

$=(x+3)(2x+1)$

6. x^4+64

Ans:

$=(x^2)^2+(8)^2$

Adding and subtracting by $16x^2$

$=(x^2)^2+(8)^2+16x^2-16x^2$

$=(x^2+8)^2-(4x)^2$

$=(x^2+8-4x)(x^2+8+4x)$

$=(x^2-4x+8)(x^2+4x+8)$

7. x^4+2x^2+9

Ans:

$=\left(x^2\right)^2+(3)^2+2x^2$

Adding and subtracting by $6x^2$

$=\left(x^2\right)^2+(3)^2+6x^2-6x^2+2x^2$

$=\left(x^2+3\right)^2-4x^2$

$=\left(x^2+3\right)^2-(2x)^2$

$=\left(x^2+3-2x\right)\left(x^2+3-12x\right)$

$=\left(x^2-2x+3\right)\left(x^2+2x+3\right)$

8. $(x+3)(x+4)(x+5)(x+6)-360$

Ans:

$=(x+3)(x+6)(x+4)(x+5)-360$

$=\left(x^2+9x+18\right)\left(x^2+9x+20\right)-360$

Let $x^2+9x=y$

$=(y+18)(y+20)-360$

$=y^2+18y+20y+360-360$

$=y^2+38y$

$=y(y+38)$

$=\left(x^2+9x\right)\left(x^29x+38\right)$

9. $\left(x^2+6x+3\right)\left(x^2+6x-9\right)+36$

Ans:

Let $x^2+6x=y$

$=(y+3)(y-9)+36$

$=y^2+3y-9y-27+36$

$=y^2-6y+9$

$=(y)^2-2(y)(3)+(3)^2$

$=(y-3)^2$

$=\left(x^2+6x-3\right)^2$

10. Find LCM and HCF by prime factorization method:

- $4x^3+12x^2, 8x^2+16x$

Ans:

$4x^3+12x^2=4x^2(x+3)$

$8x^2+16x=8x(x+2)$

$=4\times 2x(x+2)$

H.C.F $=4x$

L.C.M $=4x\times 2x(x+3)(x+2)$

L.C.M $=8x^2(x+3)(x+2)$

- x^3+3x^2-4x, x^2-x-6

Ans:

$x^3+3x^2-4x=x\left(x^2+3x-4\right)$

$=\left[x^2+4x-1x-4\right]$

$=x(x(x+4)-1(x+4))$

$=x(x+4)(x-1)$

$x^2-x-6=x^2-3x+2x-6$

$=x(x-3)+2(x-3)$

$=(x-3)(x+2)$

H.C.F $=1$

L.C.M $=x(x+4)(x-1)(x-3)(x+2)$

- $x^2+8x+16, x^2-16$

Ans:

$x^2+8x+16=(x)^2+2(x)(4)+(4)^2$

$=(x+4)^2$

$=(x+4)(x+4)$

$x^2-16=x^2-4^2$

$=(x-4)(x+4)$

H.C.F $=x+4$

L.C.M $=(x+4)^2(x-4)$

- x^3-9x, x^2-4x+3

Ans:

$x^3-9x=x\left(x^2-9\right)$

$=x\left[x^2-3^2\right]$

$=x(x-3)(x+3)$

$x^2-4x+3=x^2-3x-1x+3$

$=x(x-3)-1(x-3)$

$=(x-3)(x-1)$

H.C.F $=(x-3)$

L.C.M $=x(x+3)(x-1)(x-3)$

L.C.M $=x(x+3)(x-3)(x-1)$

L.C.M $=x\left(x^2-9\right)(x-1)$

11. **Find square root by factorization and division method of the expression** $16x^4+8x^2+1$

Ans:

$\left(4x^2\right)^{21}+2\left(4x^2\right)(1)+(1)^2$

$=\left(4x^2+1\right)^2$

Taking square root

$\sqrt{16x^4+8x^2+1}=\sqrt{\left(4x^2+1\right)^2}$

$=\pm\left(4x^2+1\right)$

Division method

$$\begin{array}{r|l} & 4x^2+1 \\ \hline 4x^2 & 16x^4+8x+1 \\ & \pm 16x^4 \\ \hline 8x^2+1 & 8x^2+1 \\ & \pm 8x^2 \pm 1 \\ \hline & \pm\left(4x^2+1\right) \end{array}$$

12. Huria is analyzing the total cost of her loan, modeled by the expression $C(x)=x^2-8x+15$, **where** x **represents the number of years. What is the optimal repayment period for Huria's loan?**

Ans:

$C(x)=x^2-8x+15$

$=x^2-5x-3x+15$

$=x(x-5)-3(x-5)$

$=(x-5)(x-3)$

To find optimal payment

$x-5=0$ $\qquad$ $x-3=0$

$x=5$ $\qquad$ $x=3$