

NCERT SOLUTIONS CLASS-8 MATHS

CHAPTER-14 EXERCISE-14.1

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Question 1. Calculate the common factors of the following:

(i) $16a$ and 28

(i i) $26x$ and $13ya$

(iii) $20pq$, $30rp$ and $20pqr$

(iv) $12a^3y^2$ and $5a^2y^3z^2$

(v) $8abc$ and $18ab^2$

(vi) $6pqr$, $24pq^2$ and $12p^2q$

Sol.

(i) $16a = 2 * 2 * 2 * 2 * a$

$28 = 2 * 2 * 7$

Thus, the common factors are 2 and 2

(ii) $26a = 2 * 13 * a$

$13ya = 13 * y * a$

Thus, the common factors are 13 and a

(iii) $20pq = 2 * 2 * 5 * p * q$

$30rp = 2 * 3 * 5 * r * p$

$20qr = 2 * 2 * 5 * p * q * r$

Thus, the common factors are 2, 5 and p

(iv) $12a^3y^2 = 2 * 2 * 3 * a * a * a * y * y$

$5a^2y^3z^2 = 5 * a * a * y * y * y * z * z$

Thus, the common factors are $a * a * y * y$

(v) $8abc = 2 * 2 * 2 * a * b * c$

$18ab^2 = 2 * 3 * 3 * a * b * b$

Thus, the common factors are 2, a and b

(vi) $6pqr = 2 * 3 * p * q * r$

$24pq^2 = 2 * 2 * 2 * 3 * p * q * q$

$12p^2q = 2 * 2 * 3 * p * p * q$

Thus, the common factors are 2, 3, p and q.

Question 2. Factorize the given expressions.

$$(i) 7a - 56 \quad (ii) 6a - 30b$$

$$(iii) 3a^2 + 18a \quad (iv) -12a + 20b^2$$

$$(v) 4c^2 + 4ab - 8ca \quad (vi) a^2bc + ab^2c + abc^2$$

$$(vii) ap^2q + bpq^2 + cpqw \quad (viii) 20a^2b + 30abc$$

sol.

$$(i) 7a - 56 = 7 * a - (2 * 2 * 2 * 7)$$

Taking the common factors,

$$= 7(a - 8)$$

$$(ii) 6a - 30b = (2 * 3 * a) - (2 * 3 * 5 * b)$$

Taking the common factors,

$$= 2 * 3(a - 5b)$$

$$= 6(a - 5b)$$

$$(iii) 3a^2 + 18a = 3 * a * a + (2 * 3 * 3 * a)$$

Taking the common factors,

$$= 3 * a(a + 2 * 3)$$

$$= 3a(a + 6)$$

$$(iv) -12a + 20b^2 = -(2 * 2 * 3 * a) + (2 * 2 * 5 * b * b)$$

Taking the common factors,

$$= 2 * 2(-3 * a + 5 * b * b)$$

$$= 4(-3a + 5b^2)$$

$$= -4(3a - 5b^2)$$

$$(v) 4c^2 + 4ab - 8ca = (2 * 2 * c * c) + (2 * 2 * a * b) - (2 * 2 * 2 * c * a)$$

Taking the common factors,

$$= 2 * 2(c * c + a * b - 2 * c * a)$$

$$= 4(c^2 + ab - 2ca)$$

$$(vi) a^2bc + ab^2c + abc^2 = a \cdot a \cdot b \cdot c + a \cdot b \cdot b \cdot c + a \cdot b \cdot c \cdot c$$

Taking the common factors,

$$= abc(a+b+c)$$

$$(vii) ap^2q + bpq^2 + cpqw = a \cdot p \cdot p \cdot q + b \cdot p \cdot q \cdot q + c \cdot p \cdot q \cdot w$$

Taking the common factors,

$$= p \cdot q(a \cdot p + b \cdot q + c \cdot w)$$

$$= pq(ap + bq + cw)$$

$$(viii) 20a^2b + 30abc = 2 \cdot 2 \cdot 5 \cdot a \cdot a \cdot b + 2 \cdot 3 \cdot 5 \cdot a \cdot b \cdot c$$

Taking the common factors,

$$= 2 \cdot 5 \cdot a \cdot b(2 \cdot a + 3 \cdot c)$$

$$= 10ab(2a + 3c)$$

Question 3. Factorize the following expressions:

$$(i) a^2 + ab + 19a + 19b$$

$$(ii) 20ab - 8a + 5a - 2$$

$$(iii) pa + pb - qa - qb$$

$$(iv) 18ab + 15 + 30b + 9b$$

$$(v) 8ab + c - 8 - abc$$

sol.

$$(i) a^2 + ab + 19a + 19b = a(a + b) + 19(a + b)$$

$$= (a + 19)(a + b)$$

$$(ii) 20ab - 8a + 5b - 2 = 4a(5b - 2) + 1(5b - 2)$$

$$= (4a + 1)(5b - 2)$$

$$(iii) pa + pb - qa - qb = p(a + b) - q(a + b)$$

$$= (a + b)(p - q)$$

$$(iv) 18ab + 15 + 30a + 9b = 18ab + 30a + 15 + 9b$$

$$= 6a(3b + 5) + 3(5 + 3b)$$

$$= (6a + 3)(3b + 5)$$

$$(\vee) 8ab + c - 8 - abc = 8ab - 8 + c - abc$$

$$= 8(ab - 1) - c(ab - 1)$$

$$= (8 - c)(ab - 1)$$

$$\text{Or, } (-1)(c - 8)(-1)(1 - ab)$$

$$\text{Thus, we have : } (1 - ab)(c - 8)$$

