Chapter 7: Factorisation
Page number: 99
Exercise 7A

Question 1. (i)
Solution:
$12x+15=3(4x+5)$
(ii)
Solution:
$14m-21=7(2m-3)$
(iii)
Solution:
$9n-12n^2=3n(3-4n)$

Question 2. (i)
Solution:
$16a^2-24ab=8a(2a-3b)$
(ii)
Solution:
$15ab^2-20a^2b=5ab(3b-4a)$
(iii)
Solution:
$12x^2y^3-21x^3y^2=3x^2y^2(4y-7x)$

Question 3. (i)
Solution:
$24x^3-36x^2y=6x^2(4x-6y)$
(ii)
Solution:
$10x^3-15x^2=5x^2(2x-3)$
(iii)
Solution:
$36x^3y-60x^2y^3z=12x^2y(3x-5y^2z)$

Question 4. (i)
Solution:
$9x^3-6x^2+12x=3x(3x^2-2x+4)$
(ii)

Solution:

$8x^2 - 72xy + 12x = 4x(2x^2 - 18y + 3)$

(iii)

Solution:

$18a^3b^3 - 27a^2b^3 + 36a^3b^2 = 9a^2b^2(2ab - 3b + 4a)$

Question 5. (i)

Solution:

$14x^3 + 21x^4y - 28x^2y^2 = 7x^2(2x + 3x^2y - 4y^2)$

(ii)

Solution:

$-5 - 10t + 20t^2 = 5(-1 - 2t + 4t^2)$

Question 6. (i)

Solution:

$x(x+3) + 5(x+3) = (x+3)(x+5)$

(ii)

Solution:

$5x(x-4) - 7(x-4) = (x-4)(5x-7)$

(iii)

Solution:

$2m(1-n) + 3(1-n) = (1-n)(2m+3)$

Question 7.

Solution:

$6a(a-2b) + 5b(a-2b) = (a-2b)(6a+5b)$

Question 8.

Solution:

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

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

$= x^2(x+1)(2a-b)$

Question 9.

Solution:

$9a(3a-5b) - 12a^2(3a-5b)$

$= (3a-5b)(9a - 12a^2)$

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

Question 10.

Solution:

$$(x+5)^2-4(x+5)$$
$$=(x+5)\{(x+5)-4\}$$
$$=(x+5)(x+1)$$

Question 11.

Solution:

$$3(a-2b)^2-5(a-2b)$$
$$=(a-2b)\{3(a-2b)-5\}$$
$$=(a-2b)(3a-6b-5)$$

Question 12.

Solution:

$$2a+6b-3(a+3b)^2$$
$$=2(a+3b)-3(a+3b)^2$$
$$=(a+3b)\{2-3(a+3b)\}$$
$$=(a+3b)(2-3a-9b)$$

Question 13.

Solution:

$$16(2p-3q)^2-4(2p-3q)$$
$$=(2p-3q)\{16(2p-3q)-4\}$$
$$=(2p-3q)(32p-48q-4)$$

Question 14.

Solution:

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

Question 15.

Solution:

$$12(2x-3y)^2-16(3y-2x)$$
$$=12(2x-3y)^2+16(2x-3y)$$
$$=(2x-3y)\{12(2x-3y)+16\}$$
$$=(2x-3y)(24x-36y+16)$$

Question 16.

Solution:

$$(x+y)(2x+5)-(x+y)(x+3)$$
$$=(x+y)\{(2x+5)-(x+3)\}$$
$$=(x+y)(2x+5-x-3)$$
$$=(x+y)(x+2)$$

Question 17.

Solution:

$$ar+br+at+bt$$
$$=(ar+br)+(at+bt)$$
$$=r(a+b)+t(a+b)$$
$$=(a+b)(r+t)$$

Question 18.

Solution:

$$x^2-ax-bx+ab$$
$$=(x^2-bx)-(ax+ab)$$
$$=x(x-b)-a(x-b)$$
$$=(x-b)(x-a)$$

Question 19.

Solution:

$$ab^2-bc^2-ab+c^2$$
$$=(ab^2-ab)-(bc^2-c^2)$$
$$=ab(b-1)-c^2(b-1)$$
$$=(b-1)(ab-c^2)$$

Question 20.

Solution:

$$x^2-xz+xy-yz$$
$$=(x^2+xy)-(xz+yz)$$
$$=x(x+y)-z(x+y)$$
$$=(x+y)(x-z)$$

Question 21.

Solution:

$$6ab - b^2 + 12ac - 2bc$$
$$= (6ab + 12ac) - (b^2 + 2bc)$$
$$= 6a(b + 2c) - b(b + 2c)$$
$$= (b + 2c)(6a - b)$$

Question 22.

Solution:

$$(x - 2y)^2 + 4x - 8y$$
$$= (x - 2y)^2 + 4(x - 2y)$$
$$= (x - 2y)\{(x - 2y) + 4\}$$
$$= (x - 2y)(x - 2y + 4)$$

Question 23.

Solution:

$$y^2 - xy(1 - x) - x^3$$
$$= y^2 - xy + x^2y - x^3$$
$$= y(y - x) + x^2(y - x)$$
$$= (y - x)(y + x^2)$$

Question 24.

Solution:

$$(ax + by)^2 + (bx - ay)^2$$
$$= (a^2x^2 + b^2y^2 + 2axby) + (b^2x^2 + a^2y^2 - 2bxay)$$
$$= a^2x2 + a^2y^2 + b^2y^2 + b^2x^2 + 2axby - 2bxay$$
$$= a^2(x^2 + y^2) + b^2(x^2 + y^2)$$
$$= (x^2 + y^2)(a^2 + b^2)$$

Question 25.

Solution:

$$ab^2 + (a - b)b - 1$$
$$= ab^2 + ba - b - 1$$
$$= ab(b + 1) - 1(b + 1)$$
$$= (b + 1)(ab - 1)$$

Question 26.

Solution:

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

Question 27.

Solution:

$$ab(x^2 + y^2) - xy(a^2 + b^2)$$
$$= abx^2 + aby^2 - a^2xy - b^2xy$$
$$= abx^2 - a^2xy + aby^2 - b^2xy$$
$$= ax(bx - ay) + by(ay - bx)$$
$$= ax(bx - ay) - by(bx - ay)$$
$$= (bx - ay)(ax - by)$$

Question 28.

Solution:

$$x^2 - x(a + 2b) + 2ab$$
$$= x^2 - ax - 2bx + 2ab$$
$$= x^2 - 2bx - ax + 2ab$$
$$= (x^2 - 2bx) - (ax - 2ab)$$
$$= x(x - 2b) - a(x - 2b)$$
$$= (x - 2b)(x - a)$$

Page number: 100

Exercise 7B

Question 1.

Solution:

$$x^2 - 36$$
$$= x^2 - (6)^2$$
$$= (x + 6)(x - 6)$$

Question 2.
Solution:

$4a^2 - 9$

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

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

Question 3.
Solution:

$81 - 49x^2$

$= (9)^2 - (7x)^2$

$= (9 + 7x)(9 - 7x)$

Question 4.
Solution:

$4x^2 - 9y^2$

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

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

Question 5.
Solution:

$16a^2 - 225b^2$

$= (4a)^2 - (15b)^2$

$= (4a + 15b)(4a - 15b)$

Question 6.
Solution:

$9a^2b^2 - 25$

$= (3ab)^2 - (5)^2$

$= (3ab + 5)(3ab - 5)$

Question 7.
Solution:

$16a^2 - 144$

$= (4a)^2 - (12)^2$

$= (4a + 12)(4a - 12)$

Question 8.

Solution:

$$63a^2 - 112b^2$$
$$= 7(9a2 - 16b2)$$
$$= 7\{(3a)2 - (4b)2\}$$
$$= 7\{(3a + 4b)(3a - 4b)\}$$

Question 9.

Solution:

$$20a^2 - 45b^2$$
$$= 5(4a^2 - 9b^2)$$
$$= 5\{(2a)^2 - (3b)^2\}$$
$$= 5\{(2a + 3b)(2a - 3b)\}$$

Question 10.

Solution:

$$12x^2 - 27$$
$$= 3(4x2 - 9)$$
$$= 3\{(2x)2 - (3)2\}$$
$$= 3\{(2x + 3)(2x - 3)\}$$

Question 11.

Solution:

$$x^3 - 64x$$
$$= x\{(x)^2 - (8)^2\}$$
$$= x\{(x + 8)(x - 8)\}$$

Question 12.

Solution:

$$16x^5 - 144x^3$$
$$= x^3(16x^2 - 144)$$
$$= x^3\{(4x)^2 - (12)^2\}$$
$$= x^3\{(4x + 12)(4x - 12)\}$$

Question 13.

Solution:

$$3x^5 - 48x^3$$
$$= 3x^3(x^2 - 16)$$
$$= 3x^2\left\{(x)^2 - (4)^2\right\}$$
$$= 3x^2\left\{(x+4)(x-4)\right\}$$

Question 14.

Solution:

$$16p^3 - 4p$$
$$= 4p(4p^2 - 1)$$
$$= 4p\left\{(2p)^2 - (1)^2\right\}$$
$$= 4p\left\{(2p+1)(2p-1)\right\}$$

Question 15.

Solution:

$$63a^2b^2 - 7$$
$$= 7(9a^2b^2 - 1)$$
$$= 7\left\{(3ab)^2 - (1)^2\right\}$$
$$= 7\left\{(3ab+1)(3ab-1)\right\}$$

Question 16.

Solution:

$$1 - (b-c)^2$$
$$= (1)^2 - (b-c)^2$$
$$= (1+b-c)(1-b+c)$$

Question 17.

Solution:

$$(2a+3b)^2 - 16c^2$$
$$= (2a+3b)^2 - (4c)^2$$
$$= (2a+3b+4c)(2a+3b-4c)$$

Question 18.

Solution:

$(l+m)^2-(l-m)^2$

$=(l+m+l-m)(l+m-l+m)$

$=(2l)(2m)$

Question 19.

Solution:

$(2x+5y)^2-1$

$=(2x+5y)^2-(1)^2$

$=(2x+5y+1)(2x+5y-1)$

Question 20.

Solution:

$36c^2-(5a+b)^2$

$=(6c)^2-(5a+b)^2$

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

Question 21.

Solution:

$(3x-4y)^2-25z^2$

$=(3x-4y)^2-(5z)^2$

$=(3x-4y+5z)(3x-4y-5z)$

Question 22.

Solution:

x^2-y^2-2y-1

$=x^2-(y^2+2y+1)$

$=x^2-(y+1)^2$

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

Question 23.

Solution:

$25-a^2-b^2-2ab$

$=(5)^2-(a^2+2ab+b^2)$

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

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

Question 24.

Solution:

$$25a^2 - 4b^2 + 28bc - 49c^2$$
$$= (5a)^2 - (4b^2 - 28bc + 49c^2)$$
$$= (5a)^2 - (2b - 7c)^2$$
$$= (5a + 2b - 7c)(5a - 2b + 7c)$$

Question 25.

Solution:

$$9a^2 - b^2 + 4b - 4$$
$$= (3a)^2 - (b^2 + 4b + 4)$$
$$= (3a)^2 - (b + 2)^2$$
$$= (3a + b + 2)(3a - b - 2)$$

Question 26.

Solution:

$$100 - (x - 5)^2$$
$$= (10)^2 - (x - 5)^2$$
$$= (10 + x - 5)(10 - x + 5)$$
$$= (5 + x)(15 - x)$$

Question 27.

Solution:

$$\left\{(405)^2 - (395)^2\right\}$$
$$= (405 + 395)(405 - 395)$$
$$= 800 \times 10$$
$$= 8000$$

Question 28.

Solution:

$$\left\{(7.8)^2 - (2.2)^2\right\}$$
$$= (7.8 + 2.2)(7.8 - 2.2)$$
$$= 10 \times 5.6$$
$$= 56$$

Page number: 101
Exercise 7C

Factorise:
Question 1.
Solution:

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

Question 2.
Solution:

$$x^2+14x+49$$
$$=x^2+7x+7x+49$$
$$=x(x+7)+7(x+7)$$
$$=(x+7)(x+7)$$

Question 3.
Solution:

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

Question 4.
Solution:

$$9+6z+z^2$$
$$=z^2+6z+9$$
$$=z^2+3z+3z+9$$
$$=z(z+3)+3(z+3)$$
$$=(z+3)(z+3)$$

Question 5.
Solution:

$$x^2 + 6ax + 9a^2$$
$$= 9a^2 + 6ax + x^2$$
$$= (3a + x)^2$$
$$= (3a + x)(3a + x)$$

Question 6.
Solution:

$$4y^2 + 20y + 25$$
$$= (2y + 5)^2$$
$$= (2y + 5)(2y + 5)$$

Question 7.
Solution:

$$36a^2 + 36a + 9$$
$$= (6a + 3)^2$$
$$= (6a + 3)(6a + 3)$$

Question 8.
Solution:

$$9m^2 + 24m + 16$$
$$= (3m + 4)^2$$
$$= (3m + 4)(3m + 4)$$

Question 9.
Solution:

$$z^2 + z + \frac{1}{4}$$
$$= \left(z + \frac{1}{2}\right)^2$$
$$= \left(z + \frac{1}{2}\right)\left(z + \frac{1}{2}\right)$$

Question 10.
Solution:
$49a^2 + 84ab + 36b^2$
$= (7a + 6b)^2$
$= (7a + 6b)(7a + 6b)$

Question 11.
Solution:
$p^2 - 10p + 25$
$= (p - 5)^2$
$= (p - 5)(p - 5)$

Question 12.
Solution:
$121a^2 - 88ab + 16b^2$
$= (11a - 4b)^2$
$= (11a - 4b)(11a - 4b)$

Question 13.
Solution:
$1 - 6x + 9x^2$
$= 9x^2 - 6x + 1$
$= (3x - 1)^2$
$= (3x - 1)(3x - 1)$

Question 14.
Solution:
$9y^2 - 12y + 4$
$= (3y - 2)^2$
$= (3y - 2)(3y - 2)$

Question 15.
Solution:
$16x^2 - 24x + 9$
$= (4x - 3)^2$
$= (4x - 3)(4x - 3)$

Question 16.
Solution:

$$m^2 - 4mn + 4n^2$$
$$= (m - 2n)^2$$
$$= (m - 2n)(m - 2n)$$

Question 17.
Solution:

$$a^2b^2 - 6abc + 9c^2$$
$$= (ab - 3c)^2$$
$$= (ab - 3c)(ab - 3c)$$

Question 18.
Solution:

$$m^4 + 2m^2n^2 + n^4$$
$$= (m^2 + n^2)^2$$
$$= (m^2 + n^2)(m^2 + n^2)$$

Question 19.
Solution:

$$(l + m)^2 - 4lm$$
$$= l^2 + m^2 + 2lm - 4lm$$
$$= (l^2 + m^2 - 2lm)$$

Page number: 102
Exercise 7D

Factorise:
Question 1.
Solution:

$$x^2 + 5x + 6$$
$$= x^2 + 2x + 3x + 6$$
$$= x(x + 2) + 3(x + 2)$$
$$= (x + 2)(x + 3)$$

Question 2.
Solution:

$$y^2 + 10y + 24$$
$$= y^2 + 4y + 6y + 24$$
$$= y(y+4) + 6(y+4)$$
$$= (y+4)(y+6)$$

Question 3.
Solution:

$$z^2 + 12z + 27$$
$$= z^2 + 3z + 9z + 27$$
$$= z(z+3) + 9(z+3)$$
$$= (z+3)(z+9)$$

Question 4.
Solution:

$$p^2 + 6p + 8$$
$$= p^2 + 2p + 4p + 8$$
$$= p(p+2) + 4(p+2)$$
$$= (p+2)(p+4)$$

Question 5.
Solution:

$$x^2 + 15x + 56$$
$$= x^2 + 7x + 8x + 56$$
$$= x(x+7) + 8(x+7)$$
$$= (x+7)(x+8)$$

Question 6.
Solution:

$$y^2 + 19y + 60$$
$$= y^2 + 4y + 15y + 60$$
$$= y(y+4) + 15(y+4)$$
$$= (y+4)(y+15)$$

Question 7.
Solution:

$$x^2 + 13x + 40$$
$$= x^2 + 5x + 8x + 40$$
$$= x(x+5) + 8(x+5)$$
$$= (x+5)(x+8)$$

Question 8.
Solution:

$$q^2 - 10q + 21$$
$$= q^2 - 3q - 7q + 21$$
$$= q(q-3) - 7(q-3)$$
$$= (q-3)(q-7)$$

Question 9.
Solution:

$$p^2 + 6p - 16$$
$$= p^2 - 2p + 8p - 16$$
$$= p(p-2) + 8(p-2)$$
$$= (p-2)(p+8)$$

Question 10.
Solution:

$$x^2 - 10x + 24$$
$$= x^2 - 4x - 6x + 24$$
$$= x(x-4) - 6(x-4)$$
$$= (x-4)(x-6)$$

Question 11.
Solution:

$$x^2 - 23x + 42$$
$$= x^2 - 2x - 21 + 42$$
$$= x(x-2) - 21(x-2)$$
$$= (x-2)(x-21)$$

Question 12.
Solution:

$$x^2 - 17x + 16$$
$$= x^2 - x - 16x + 16$$
$$= x(x-1) - 16(x-1)$$
$$= (x-1)(x-16)$$

Question 13.
Solution:

$$y^2 - 21y + 90$$
$$= y^2 - 6y - 15y + 90$$
$$= y(y-6) - 15(y-6)$$
$$= (y-6)(y-15)$$

Question 14.
Solution:

$$x^2 - 22x + 117$$
$$= x^2 - 9x - 13x + 117$$
$$= x(x-9) - 13(x-9)$$
$$= (x-9)(x-13)$$

Question 15.
Solution:

$$x^2 - 9x + 20$$
$$= x^2 - 4x - 5x + 20$$
$$= x(x-4) - 5(x-4)$$
$$= (x-4)(x-5)$$

Question 16.
Solution:

$$x^2 - x - 132$$
$$= x^2 + 12x - 11x - 132$$
$$= x(x+12) - 11(x+12)$$
$$= (x+12)(x-11)$$

Question 17.
Solution:

$$x^2 + 5x - 104$$
$$= x^2 + 13x - 8x - 104$$
$$= x(x+13) - 8(x+13)$$
$$= (x+13)(x-8)$$

Question 18.
Solution:

$$y^2 + 7y - 144$$
$$= y^2 + 16y - 9y - 144$$
$$= y(y+16) - 9(y+16)$$
$$= (y+16)(y-9)$$

Question 19.
Solution:

$$z^2 + 19z - 150$$
$$= z^2 + 25z - 6z - 150$$
$$= z(z+25) - 6(z+25)$$
$$= (z+25)(z-6)$$

Question 20.
Solution:

$$y^2 + y - 72$$
$$= y^2 + 9y - 8y - 72$$
$$= y(y+9) - 8(y+9)$$
$$= (y+9)(y-8)$$

Question 21.
Solution:

$$a^2 + 6a - 91$$
$$= a^2 + 13a - 7a - 91$$
$$= a(a+13) - 7(a+13)$$
$$= (a+13)(a-7)$$

Question 22.
Solution:

$$p^2 - 4p - 77$$
$$= p^2 + 7p - 11p - 77$$
$$= p(p+7) - 11(p+7)$$
$$-(p+7)(p-11)$$

Question 23.
Solution:

$$x^2 - 7x - 30$$
$$= x^2 + 3x - 10x - 30$$
$$= x(x+3) - 10(x+3)$$
$$= (x+3)(x-10)$$

Question 24.
Solution:

$$x^2 - 11x - 42$$
$$= x^2 - 14x + 3x - 42$$
$$= x(x-14) + 3(x-14)$$
$$= (x-14)(x+3)$$

Question 25.
Solution:

$$x^2 - 5x - 24$$
$$= x^2 + 3x - 8x - 24$$
$$= x(x+3) - 8(x+3)$$
$$= (x+3)(x-8)$$

Question 26.
Solution:

$$y^2 - 6y - 135$$
$$= y^2 - 15y + 9y - 135$$
$$= y(y-15) + 9(y-15)$$
$$= (y-15)(y+9)$$

Question 27.
Solution:

$$z^2 - 12z - 45$$
$$= z^2 - 15z + 3z - 45$$
$$= z(z-15) + 3(z-15)$$
$$= (z-15)(z+3)$$

Question 28.
Solution:

$$x^2 - 4x - 12$$
$$= x^2 - 6x + 2x - 12$$
$$= x(x-6) + 2(x-6)$$
$$= (x-6)(x+2)$$

Question 29.
Solution:

$$3x^2 + 10x + 8$$
$$= 3x^2 + 6x + 4x + 8$$
$$= 3x(x+2) + 4(x+2)$$
$$= (x+2)(3x+4)$$

Question 30.
Solution:

$$3y^2 + 14y + 8$$
$$= 3y^2 + 12y + 2y + 8$$
$$= 3y(y+4) + 2(y+4)$$
$$= (y+4)(3y+2)$$

Question 31.
Solution:

$$3z^2 - 10z + 8$$
$$= 3z^2 - 12z + 2z + 8$$
$$= 3z(z-4) + 2(z-4)$$
$$= (z-4)(3z+2)$$

Question 32.
Solution:

$$2x^2 + x - 45$$
$$= 2x^2 + 10x - 9x - 45$$
$$= 2x(x+5) - 9(x+5)$$
$$= (x+5)(2x-9)$$

Question 33.
Solution:

$$6p^2 + 11p - 10$$
$$= 6p^2 - 4p + 15p - 10$$
$$= 2p(3p-2) + 5(3p-2)$$
$$= (3p-2)(2p+5)$$

Question 34.
Solution:

$$2x^2 - 17x - 30$$
$$= 2x^2 - 12x - 5x - 30$$
$$= 2x(x-6) - 5(x-6)$$
$$= (x-6)(2x-5)$$

Question 35.
Solution:

$$7y^2 - 19y - 6$$
$$= 7y^2 - 21y + 2y - 6$$
$$= 7y(y-3) + 2(y-3)$$
$$= (y-3)(7y+2)$$

Question 36.
Solution:

$$28 - 31x - 5x^2$$
$$= 5x^2 + 31x - 28$$
$$= 5x^2 + 35x - 4x - 28$$
$$= 5x(x+7) - 4(x+7)$$
$$= (x+7)(5x-4)$$

Question 37.

Solution:

$$3+23z-8z^2$$
$$=8z^2-23z-3$$
$$=8z^2-24z+z-3$$
$$=8z(z-3)+1(z-3)$$
$$=(z-3)(8z+1)$$

Question 38.

Solution:

$$6x^2-5x-6$$
$$=6x^2+4x-9x-6$$
$$=2x(3x+2)-3(3x+2)$$
$$=(3x+2)(2x-3)$$

Question 39.

Solution:

$$3m^2+24m+36$$
$$=3(m^2+8m+12)$$
$$=3(m^2+6m+2m+12)$$
$$=3\left[m(m+6)+2(m+6)\right]$$
$$=3\left[(m+6)(m+2)\right]$$

Question 40.

Solution:

$$4n^2-8n+3$$
$$=4n^2-2n-6n+3$$
$$=2n(2n-1)-3(2n-1)$$
$$=(2n-1)(2n-3)$$

Question 41.

Solution:

$$6x^2-17x-3$$
$$=6x^2-18x+x-3$$
$$=6x(x-3)+1(x-3)$$
$$=(x-3)(6x+1)$$

Question 42.
Solution:

$7x^2 - 19x - 6$

$= 7x^2 - 21x + 2x - 6$

$= 7x(x-3) + 2(x-3)$

$= (x-3)(7x+2)$

Page number: 103
Exercise 7E

Question 1.
Solution: (d) $7(a-3b)(a+3b)$

$(7a^2 - 63b^2)$

$= 7(a^2 - 9b^2)$

$= 7\left[(a+3b)(a-3b)\right]$

Question 2.
Solution: (d) $2x(1-4x)(1+4x)$

$(2x - 32x^3)$

$= 2x(1-16x^2)$

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

Question 3.
Solution: (c) $x(x-12)(x+12)$

$x^3 - 144x$

$= x(x2-144)$

$= x\left[(x+12)(x-12)\right]$

Question 4.
Solution: (d) $2(1-5x)(1+5x)$

$(2 - 50x^2)$

$= 2(1-25x2)$

$= 2\left[(1+5x)(1-5x)\right]$

Question 5.

Solution: (a) $(a+b)(a+c)$

$a2+bc+ab+ac$

$=a^2+ab+ac+bc$

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

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

Question 6.

Solution: (a) $(pq+1)(q-1)$

$pq^2+q(p-1)-1$

$=pq^2+qp-q-1$

$=pq(q-1)+1(q-1)$

$=(q-1)(pq+1)$

Question 7.

Solution: (b) $(a-m)(b+n)$

$ab-mn+an-bm$

$=ab+an-bm-mn$

$=a(b+n)-m(b+n)$

$=(b+n)(a-m)$

Question 8.

Solution: (a) $(a-1)(b-1)$

$ab-a-b+1$

$=a(b-1)-1(b-1)$

$=(b-1)(a-1)$

Question 9.

Solution: (c) $(x+y)(x-z)$

$x2-xz+xy-yz$

$=x(x-z)+y(x-z)$

$=(x-z)(x+y)$

Question 10.

Solution: (c) $3(2m-3)(2m+3)$

$(12m^2 - 27)$

$= 3(4m^2 - 9)$

$= 3\left[(2m + 3)(2m - 3)\right]$

Question 11.

Solution: (d) $x(x+1)(x-1)$

$x^3 - x$

$= x(x^2 - 1)$

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

Question 12.

Solution: (d) $(1 + a - b)(1 - a + b)$

$1 - 2ab - (a^2 + b^2)$

$= 1 - 2ab - a^2 - b^2$

$= 1 - (a^2 + 2ab + b^2)$

$= (1)^2 - (a + b)^2$

$= (1 + a + b)(1 - a - b)$

Question 13.

Solution: (c) $(x + 2)(x + 4)$

$x^2 + 6x + 8$

$= x^2 + 4x + 2x + 8$

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

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

Question 14.

Solution: (b) $(x + 7)(x - 3)$

$x^2 + 4x - 21$

$= x^2 + 7x - 3x - 21$

$= x(x + 7) - 3(x + 7)$

$= (x + 7)(x - 3)$

Question 15.

Solution: (a) $(y - 1)(y + 3)$

$y^2 + 2y - 3$

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

$= y(y+3) - 1(y+3)$

$= (y+3)(y-1)$

Question 16.

Solution: (a) $(x+5)(x-8)$

$40 + 3x - x^2$

$= x^2 - 3x - 40$

$= x^2 - 8x + 5x - 40$

$= x(x-8) + 5(x-8)$

$= (x-8)(x+5)$

Question 17.

Solution: (b) $(x+1)(2x+3)$

$2x^2 + 5x + 3$

$= 2x^2 + 2x + 3x + 3$

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

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

Question 18.

Solution: (c) $(3a-2)(2a-3)$

$6a^2 - 13a + 6$

$= 6a^2 - 9a - 4a + 6$

$= 3a(2a-3) - 2(2a-3)$

$= (2a-3)(3a-2)$

Question 19.

Solution: (a) $(2z-1)(2z-3)$

$4z2 - 8z + 3$

$= 4z^2 - 2z - 6z + 3$

$= 2z(2z-1) - 3(2z-1)$

$= (2z-1)(2z-3)$

Question 20.

Solution: (b) $(1+8y)(3-y)$

$3+23y-8y^2$

$=8y^2-23y-3$

$=8y^2-24y+y-3$

$=8y(y-3)+1(y-3)$

$=(y-3)(8y+1)$