SOLUTIONS

Expanding

42 Expand and simplify the following expressions:

(a) $(x-8)(x+8)$

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

$= x^2 - 64$

(b) $(f+g)(f-g)$

$(f+g)(f-g) = f^2 - g^2$

(c) $(3u-4v)(3u+4v)$

$(3u-4v)(3u+4v) = (3u)^2 - (4v)^2 = 9u^2 - 16v^2$

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43 Are the following true or false?

(a) $(x+3)^2 = x^2 + 6x + 6$ false

(b) $(8-d)^2 = 64 - 16d + d^2$ true

(c) $(p+q)^2 = p^2 + 2pq + p^2$ true

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44 Expand and simplify the following expressions:

(a) $(5x-2)^2$

$(5x-2)^2 = (5x)^2 - 2\times(5x)\times 2 + 2^2$

$= 25x^2 - 20x + 4$

(b) $(3+4d)^2$

$(3+4d)^2 = (3+4d)(3+4d)$

$= 9 + 12d + 12d + 16d^2$

$= 9 + 24d + 16d^2$

(c) $(7-3e)^2$

$(7-3e)^2 = 7^2 - 2\times 7\times 3e + (3e)^2$

$= 9e^2 - 42e + 49$

45 Expand and simplify the following expressions:

(a) $(x+2)(x+4)+(x+1)(x+3)$

$(x+2)(x+4) + (x+1)(x+3)$

$x^2+4x+2x+8 + x^2+3x+x+3$

$= 2x^2+10x+11$

(b) $(p-5)(p+6)+(p-1)(p+1)$

$p^2+6p-5p-30 + p^2+p-p-1$

$= p^2+p-30+p^2-1 = 2p^2+p-31$

(c) $(q-3)(q-7)+(q+2)(q+9)$

$q^2-7q-3q+21 + q^2+9q+2q+18$

$= 2q^2+q+39$

46 Expand and simplify the following expressions:

(a) $(x+3)^2+(x-6)(x-2)$

$x^2+6x+9 + x^2-2x-6x+12$

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

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

$y^2-4y+4 + y^2-5y+y-5$

$= y^2-4y+4+y^2-4y-5 = 2y^2-8y-1$

(c) $(z+6)(z-3)-(z-1)^2$

$z^2-3z+6z-18-(z^2-2z+1)$

$= z^2+3z-18-z^2+2z-1$

$= 5z-19$

47 What is the equivalent of $(p+3)^2-(p-3)^2$?

A p^2-9

B p^2+6p+9

C $2p^2+12p+18$

D $12p$

E 0

$(p+3)(p+3) - (p-3)(p-3)$

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

$= p^2+6p+9-p^2+6p-9$

$= 12p$

48 Expand the following expressions.

(a) $2(y-3)$ $2y-6$

(b) $-(q-11)$ $-q+11$

(c) $-4(6x+9)$ $-24x-36$

(d) $-6(-8-3x)$ $48+18x$

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49 Expand the following expressions.

(a) $m(9+m)$ $9m+m^2$

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

(c) $-y(6y-3)$ $-6y^2+18y$

(d) $-5x(7-2x)$ $-35x+10x^2$

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50 Expand and simplify by collecting like terms.

(a) $3(q-4)+10$

$3q-12+10$

$=3q-2$

(b) $-6y(y+1)-4y$

$-6y^2-6y-4y \quad =-6y^2-10y$

(c) $2q+5-3p(5q-3)$ $2q+5-15pq+9p$

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51 If the equivalent of

$2(x-4y)+\nabla(x+4y)=5x+4y$, then the missing number ∇ is:

A 1

B 2

C 3

D 4

E 5

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52 Expand and simplify the following expressions.

(a) $-2(3x + 4y) + 2(4x - 3y)$

$-6x - 8y + 8x - 6y$

$= 2x - 14y$

(b) $4(c - 4d) - 6(3c - 5d)$

$4c - 16d - 18c + 30d$

$= 14d - 14c$

(c) $-3(2a + b) - (3a + 2b)$

$-6a - 3b - 3a - 2b$

$= -9a - 5b$

53 Expand and simplify the following expressions.

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

$xy + 3x + xy - 2x$

$= 2xy + x$

(b) $2p(3p + 4) - 3(4p - 4)$

$6p^2 + 8p - 12p - 16$

$= 6p^2 - 4p - 16$

(c) $-6c(3c - 7d) + d(4d - 8c)$

$-18c^2 + 42cd + 4d^2 - 8cd$

$= -14c^2 + 34cd$

54 Are the following true or false?

(a) $(x + 1)(x - 6) = x^2 - 6x + 6$ false

(b) $(y - 2)(y - 3) = y^2 - 5y + 6$ true

(c) $(8 - z)(3 + z) = 11 - 8z - z^2$ false

Factorising

65 Factorise $6x + 9y - 27z$.

HCF = 3

$3(2x + 3y - 9z)$

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66 Factorise $24pq - 4q^2$.

HCF = $4q$

$4q(6p - q)$

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67 Factorise $-25x(a - 3n) - 15xy(a - 3n)$.

HCF = $-5x(a-3n)$

$-5x(a-3n)(5+3y)$

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68 Factorise $8x^2 - 12xy - 2px + 3py$.

$= 4x(2x - 3y) - p(2x - 3y)$

$= (2x - 3y)(4x - p)$

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69 Factorise $x^2 - 49$.

$x^2 - 7^2$

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

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70 Factorise $(x + 1)^2 - y^2$.

$(x + 1 - y)(x + 1 + y)$ (D.O.T.S)

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71 (a) Factorise $4a^2 - 9b^2$

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

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

(b) Factorise $36x^2 - 25y^2$

$= (6x)^2 - (5y)^2$

$= (6x - 5y)(6x + 5y)$

74 (a) Factorise $7x + 21xy$.

HCF $= 7x$

$7x(1 + 3y)$

(b) Factorise $56xy - 24xz$.

HCF $= 8x$

$8x(7 - 3z)$

75 Factorise $-6x^2 - 3xy$.

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

76 Factorise $3c^2d^3 + 9c^3d^2 - 12cd^2$.

HCF $= 3cd^2$

$= 3cd^2(cd + 3c^2 - 4)$

77 Factorise $3(x + y) - a(x + y)$.

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

78 Factorise $6x(b - c) + x^2(b - c)$.

$x(b-c)(6+x)$

79 Factorise $8x(p - 2q) + 4x(p + 2q)$.

$= 4x(2(p-2q) + p+2q)$

$= 4x(2p - 4q + p + 2q)$

$= 4x(3p - 2q)$

80 Factorise $ax + 2x + 2ay + 4y$.

$= x(a+2) + 2y(a+2)$

$= (a+2)(x+2y)$

81 Factorise $7a^2 - 14ab + 20ax - 40bx$.

$7a(a-2b) + 20x(a-2b)$

$= (a-2b)(7a + 20x)$