

# Algebra

## Topic 7: Special products – difference of two squares

**QUESTION 1** Expand and simplify the following.

a  $(x+1)(x+2) =$  \_\_\_\_\_

b  $(x+2)(x+3) =$  \_\_\_\_\_

c  $(a+3)(a+5) =$  \_\_\_\_\_

d  $(m+6)(m+1) =$  \_\_\_\_\_

e  $(p+8)(p+2) =$  \_\_\_\_\_

f  $(y+3)(y+7) =$  \_\_\_\_\_

g  $(a+4)(a+7) =$  \_\_\_\_\_

h  $(d+3)(d+9) =$  \_\_\_\_\_

i  $(2a+3)(a+5) =$  \_\_\_\_\_

j  $(3a+1)(2a+6) =$  \_\_\_\_\_

k  $(4a+6)(2a+3) =$  \_\_\_\_\_

l  $(2x+5)(3x+1) =$  \_\_\_\_\_

**QUESTION 2** Expand and simplify.

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

b  $(x-3)(x+2) =$  \_\_\_\_\_

c  $(y-4)(y+6) =$  \_\_\_\_\_

d  $(y+5)(y-3) =$  \_\_\_\_\_

e  $(a+7)(a-3) =$  \_\_\_\_\_

f  $(x+6)(x-2) =$  \_\_\_\_\_

g  $(2y+1)(y-2) =$  \_\_\_\_\_

h  $(3x+2)(x-3) =$  \_\_\_\_\_

i  $(2x+1)(3x-1) =$  \_\_\_\_\_

j  $(x+7)(2x-1) =$  \_\_\_\_\_

k  $(x+8)(3x-5) =$  \_\_\_\_\_

l  $(2x+3)(2x-3) =$  \_\_\_\_\_

m  $(3x-4)(2x+5) =$  \_\_\_\_\_

n  $(x-3)(x-4) =$  \_\_\_\_\_

**QUESTION 3** Find the following products and simplify.

a  $(a+3)(4+a) =$  \_\_\_\_\_

b  $(a+5)(6+a) =$  \_\_\_\_\_

c  $(2a+1)(3-a) =$  \_\_\_\_\_

d  $(4+x)(x+9) =$  \_\_\_\_\_

e  $(5-n)(n+7) =$  \_\_\_\_\_

f  $(x-6)(7-x) =$  \_\_\_\_\_

g  $(3x+2)(2+x) =$  \_\_\_\_\_

h  $(3n+1)(5-n) =$  \_\_\_\_\_

i  $(2a-6)(a+7) =$  \_\_\_\_\_

j  $(x+y)(x-y) =$  \_\_\_\_\_

k  $(2m+n)(2m-n) =$  \_\_\_\_\_

l  $(a-b)(a+b) =$  \_\_\_\_\_

m  $(2x-3y)(2x+3y) =$  \_\_\_\_\_

n  $(a-b)(a-b) =$  \_\_\_\_\_

# Algebra

## Topic 8: Special products – perfect squares

**QUESTION 1** Expand and simplify the following.

a  $(x + 3)^2 =$  \_\_\_\_\_

b  $(y + 2)^2 =$  \_\_\_\_\_

c  $(m + 7)^2 =$  \_\_\_\_\_

d  $(x - 4)^2 =$  \_\_\_\_\_

e  $(x - 9)^2 =$  \_\_\_\_\_

f  $(x - 3)^2 =$  \_\_\_\_\_

g  $(y + 11)^2 =$  \_\_\_\_\_

h  $(x - 5)^2 =$  \_\_\_\_\_

i  $(m - 2)^2 =$  \_\_\_\_\_

j  $(x + y)^2 =$  \_\_\_\_\_

k  $(a - b)^2 =$  \_\_\_\_\_

l  $(m + n)^2 =$  \_\_\_\_\_

**QUESTION 2** Expand and simplify.

a  $(2x + 3)^2 =$  \_\_\_\_\_

b  $(2m + 1)^2 =$  \_\_\_\_\_

c  $(3y - 1)^2 =$  \_\_\_\_\_

d  $(4a + 1)^2 =$  \_\_\_\_\_

e  $(3x - 4)^2 =$  \_\_\_\_\_

f  $(2x - 3y)^2 =$  \_\_\_\_\_

g  $(2a + 1)^2 =$  \_\_\_\_\_

h  $(5m - 1)^2 =$  \_\_\_\_\_

i  $(6y + 1)^2 =$  \_\_\_\_\_

j  $(3n + 2)^2 =$  \_\_\_\_\_

k  $(2x + 5y)^2 =$  \_\_\_\_\_

l  $(a + 3b)^2 =$  \_\_\_\_\_

m  $(2x + y)^2 =$  \_\_\_\_\_

n  $(x - 3y)^2 =$  \_\_\_\_\_

**QUESTION 3** Expand and simplify the following.

a  $(x + 3)^2 + 3(x - 1) =$  \_\_\_\_\_  
\_\_\_\_\_

b  $(2a - 1)^2 - 4(a - 3) =$  \_\_\_\_\_  
\_\_\_\_\_

c  $(y - 2)^2 + (y + 3)(y - 3) =$  \_\_\_\_\_  
\_\_\_\_\_

d  $(a + b)^2 - (a + b)(a - b) =$  \_\_\_\_\_  
\_\_\_\_\_

e  $(a + b)^2 + (a - b)^2 =$  \_\_\_\_\_  
\_\_\_\_\_

f  $(a + 3b)(a - 3b) + (a + b)^2 =$  \_\_\_\_\_  
\_\_\_\_\_

g  $(3x + 4y)(3x - 4y) + (x + y)^2 =$  \_\_\_\_\_  
\_\_\_\_\_

h  $(x + 1)^2 + (x + 2)^2 =$  \_\_\_\_\_  
\_\_\_\_\_

# Answers – Algebra

**PAGE 1** 1 a  $x+5$  b  $x+y$  c  $ab$  d  $p-q$  e  $\sqrt{m}$  f  $7x$  g  $d^2$  h  $\frac{x}{n}$  i  $5(x+3)$  j  $\sqrt{xy}$  k  $4x+9$  or  $4(x+9)$  l  $\frac{x}{2}-6$  m  $7x^2$   
 n  $\sqrt{5x}$  2 a  $\$pd$  b  $Khkm$  c  $e+2$  d  $e+1$  e  $90^\circ-a^\circ$  3 a  $\frac{2m}{7}$  b  $5xy+9$  c  $5(p+3)$  d  $\frac{m}{n}+p$  4 a  $4x+14$  b  $4a$  c  $12x$   
 5 a  $x(2x+3)$  b  $x^2$  c  $\frac{1}{2}xy$

**PAGE 2** 1 a 5 b 7 c 6 d 9 e 1 f 3 g 13 h 25 i 20 j 13 k 21 l 48 m 18 n 25 o 1 p 2 q  $\frac{5}{6}$  r 5 2 a 7  
 b 0 c -1 d 13 e -1 f 49 g 1 h 12 i 5 j 41 k -54 l 4 m -36 n  $\frac{1}{2}$  o  $-\frac{2}{6}$  3 a  $\frac{9}{20}$  b  $\frac{1}{20}$  c 9 d  $\frac{1}{9}$  e  $9\frac{1}{9}$  f  $\frac{41}{400}$   
 g  $\frac{9}{400}$  h  $\frac{1}{9}$  4 2.767 5 25.272 6 12.1

**PAGE 3** 1 a  $8x$  b  $15a$  c  $9y$  d  $2x$  e  $3x$  f  $7a$  g  $12x$  h  $11x$  i 1 j  $3y-3x$  k  $3a+3b$  l  $m^2+5mn$  m  $2a^2+2a+9$   
 n  $3x^2$  o  $9a^2+a$  2 a  $6xy$  b  $24pq$  c  $10ab$  d  $6x^2y$  e  $7x^2$  f  $40mn$  g  $-16xy$  h  $6mn$  i  $9m^2n^2$  j  $-10a^3$  k  $-8x^4$  l  $12a^2b^2$   
 m  $30xy$  n  $xy^2z$  o  $2a^2b^2$  3 a  $2x$  b 5 c  $x$  d 1 e  $2x^2$  f  $\frac{5m}{n}$  g 24 h  $\frac{2}{a}$  i  $4q$  j  $-y$  k  $-4$  l  $z$  m  $-5$  n  $-3$  o 4  
 4 a  $15a+14$  b  $23-3a$  c  $7x^2+9x$  d  $54xy^2$  e  $60xy$  f  $30x^2$  g  $12ab$  h  $-3x$  i  $18xy$  5 a  $18a$  b  $15x$  c  $-12a$  d  $16a$  e  $32x^2$   
 f  $6ab$  g  $29p$  h  $10x$  i  $12p$

**PAGE 4** 1 a  $2a$  b  $x$  c  $2m$  d  $\frac{5a}{6}$  e  $\frac{11a}{15}$  f  $\frac{29a}{35}$  g  $\frac{11}{2x}$  h  $\frac{19}{9x}$  i  $\frac{5m}{3n}$  2 a a b  $\frac{x}{3}$  c  $\frac{m}{3}$  d  $\frac{x}{6}$  e  $\frac{a}{10}$  f  $\frac{11q}{15}$   
 g  $\frac{1}{6m}$  h  $\frac{3}{10x}$  i  $\frac{7m}{3n}$  3 a  $\frac{xy}{20}$  b  $\frac{a^2}{12}$  c  $\frac{am}{bn}$  d  $\frac{b}{2}$  e 1 f 2 g  $3q$  h  $\frac{8m^2}{3}$  i  $2\frac{2}{3}$  4 a 3 b  $1\frac{1}{3}$  c  $\frac{2}{7}$  d 2 e  $\frac{1}{4}$  f  $\frac{1}{3}$   
 g 6 h  $a^2$  i  $16\frac{4}{5}$

**PAGE 5** 1 a  $3x+6$  b  $2a+10$  c  $5y+20$  d  $8x-8$  e  $7m-14$  f  $9x-45$  g  $6a+9$  h  $20a+12$  i  $56a+49$  j  $-10a+14$   
 k  $-18m+27$  l  $16a-48$  m  $-x^2-9x$  n  $-y^2+3y$  o  $-2m^2-9m$  2 a  $6a+27$  b  $5x-11$  c  $7m-6$  d  $15a+16$  e  $y-7$  f  $14x-2$   
 g  $9x-1$  h  $7x-7$  i 30 j  $15a-9$  k  $-3a+11$  l  $6x+25$  3 a  $8x+7$  b  $5y+13$  c  $6x-2$  d  $4a-16$  e  $4m+27$  f  $15y-75$   
 g  $x^2+8x+5$  h  $p^2-5p+3$  i  $a^2+2ab-b^2$  j  $14x+25$  k  $9x+22$  l  $2x^2+3x$

**PAGE 6** 1 a  $x^2+3x+2$  b  $x^2+5x+6$  c  $a^2+8a+15$  d  $m^2+7m+6$  e  $p^2+10p+16$  f  $y^2+10y+21$  g  $a^2+11a+28$   
 h  $d^2+12d+27$  i  $2a^2+13a+15$  j  $6a^2+20a+6$  k  $8a^2+24a+18$  l  $6x^2+17x+5$  2 a  $a^2+a-6$  b  $x^2-x-6$  c  $y^2+2y-24$   
 d  $y^2+2y-15$  e  $a^2+4a-21$  f  $x^2+4x-12$  g  $2y^2-3y-2$  h  $3x^2-7x-6$  i  $6x^2+x-1$  j  $2x^2+13x-7$  k  $3x^2+19x-40$  l  $4x^2-9$   
 m  $6x^2+7x-20$  n  $x^2-7x+12$  3 a  $a^2+7a+12$  b  $a^2+11a+30$  c  $-2a^2+5a+3$  d  $x^2+13x+36$  e  $-n^2-2n+35$  f  $-x^2+13x-42$   
 g  $3x^2+8x+4$  h  $-3n^2+14n+5$  i  $2a^2+8a-42$  j  $x^2-y^2$  k  $4m^2-n^2$  l  $a^2-b^2$  m  $4x^2-9y^2$  n  $a^2-2ab+b^2$

**PAGE 7** 1 a  $x^2-4$  b  $x^2-9$  c  $y^2-1$  d  $m^2-25$  e  $n^2-49$  f  $p^2-16$  g  $64-x^2$  h  $y^2-36$  i  $a^2-b^2$  j  $x^2-y^2$  k  $m^2-n^2$   
 l  $l^2-m^2$  2 a  $9a^2-1$  b  $4x^2-9$  c  $16a^2-25$  d  $49m^2-n^2$  e  $16q^2-9$  f  $25x^2-49$  g  $16a^2-9b^2$  h  $4x^2-y^2$  i  $25x^2-16y^2$   
 j  $x^2-81y^2$  k  $4a^2-49b^2$  l  $25m^2-n^2$  m  $81a^2-121b^2$  n  $9a^2-64b^2$  3 a  $25x^2-1$  b  $49a^2-4$  c  $64x^2-49$  d  $4x^2-9y^2$   
 e  $16x^2-81y^2$  f  $36x^2-49y^2$  g  $a^2-144$  h  $4x^2-81$  i  $9x^2-100$  j  $4m^2-n^2$  k  $16x^2-81y^2$  l  $25x^2-121$  m  $64a^2-121b^2$   
 n  $9a^2-49b^2$

**PAGE 8** 1 a  $x^2+6x+9$  b  $y^2+4y+4$  c  $m^2+14m+49$  d  $x^2-8x+16$  e  $x^2-18x+81$  f  $x^2-6x+9$  g  $y^2+22y+121$   
 h  $x^2-10x+25$  i  $m^2-4m+4$  j  $x^2+2xy+y^2$  k  $a^2-2ab+b^2$  l  $m^2+2mn+n^2$  2 a  $4x^2+12x+9$  b  $4m^2+4m+1$  c  $9y^2-6y+1$   
 d  $16a^2+8a+1$  e  $9x^2-24x+16$  f  $4x^2-12xy+9y^2$  g  $4a^2+4a+1$  h  $25m^2-10m+1$  i  $36y^2+12y+1$  j  $9n^2+12n+4$   
 k  $4x^2+20xy+25y^2$  l  $a^2+6ab+9b^2$  m  $4x^2+4xy+y^2$  n  $x^2-6xy+9y^2$  3 a  $x^2+9x+6$  b  $4a^2-8a+13$  c  $2y^2-4y-5$  d  $2ab+2b^2$   
 e  $2a^2+2b^2$  f  $2a^2-8b^2+2ab$  g  $10x^2-15y^2+2xy$  h  $2x^2+6x+5$

**PAGE 9** 1 D 2 C 3 C 4 C 5 B 6 D 7 C 8 A 9 D 10 D

**PAGE 10** 1  $kx$  2 34 3  $n-13$  4  $-11x^2+27$  5  $7x^2+3x$  6  $4x^2-9$  7  $9x^2-24x+16$  8  $2x^2-6x$  9  $\frac{6a-1}{18}$  10  $\frac{9x+5}{x^2}$  11  $\frac{10m^2}{n^2}$   
 12 4 13  $4m^2-n^2$  14  $x^2+4ax+4a^2-x-2a$  15  $4x^2-24xy+4y^2$