

5.2 Special Products Practice

MPM2D

Jensen

1. Expand and simplify.

a) $(x + 4)^2$

b) $(y + 7)^2$

c) $(a + 8)^2$

d) $(q + 5)^2$

2. Expand and simplify.

a) $(3y + 6)^2$

b) $(3x + 2y)^2$

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

d) $(6c + 7d)^2$

3. Expand and simplify.

a) $(x - 6)^2$

b) $(b - 25)^2$

c) $(r - 11)^2$

d) $(e - 7)^2$

4. Expand and simplify.

a) $(8a - 1)^2$

b) $(2u - 3v)^2$

c) $(6p - 7)^2$

d) $(5q - 8r)^2$

5. Expand and simplify.

a) $(v - 2)(v + 2)$

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

c) $(x + y)(x - y)$

d) $(r - s)(r + s)$

6. Expand and simplify.

a) $(6g - 7h)(6g + 7h)$

b) $(3x + y)(3x - y)$

c) $(g - 9x)(g + 9x)$

d) $(4x - 5y)(4x + 5y)$

7. A parabola has equation $y = (x - 3)^2$.

a) Identify the coordinates of the vertex.

b) Expand and simplify the equation.

c) Verify that the coordinates of the vertex satisfy your equation from part b).

8. The side length of a square is represented by x centimetres. The length of a rectangle is 3 cm greater than the side length of the square. The width of the rectangle is 3 cm less than the side length of the square. Which figure has the greater area and by how much?

9. **Bonus:** Expand and simplify.

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

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

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

d) $3(2b + 1)(2b - 1) + (b - 3)^2$

e) $(3x^2 + 5x - 1)^2$

f) $(2x - 3)^3$

Answers

1. a) $x^2 + 8x + 16$ b) $y^2 + 14y + 49$
c) $a^2 + 16a + 64$ d) $q^2 + 10q + 25$
2. a) $6y^2 + 36y + 36$ b) $6x^2 + 12xy + 4y^2$
c) $4x^2 + 4xy + y^2$ d) $36c^2 + 84cd + 49d^2$
3. a) $x^2 - 12x + 36$ b) $b^2 - 50b + 625$
c) $r^2 - 22r + 121$ d) $e^2 - 14e + 49$
4. a) $64a^2 - 16a + 1$ b) $4u^2 - 12uv + 9v^2$
c) $36p^2 - 84p + 49$ d) $25q^2 - 80qr + 64r^2$
5. a) $v^2 - 4$ b) $x^2 - 36$
c) $x^2 - y^2$ d) $r^2 - s^2$
6. a) $36g^2 - 49h^2$ b) $9x^2 - y^2$
c) $g^2 - 81x^2$ d) $16x^2 - 25y^2$
7. a) $(3, 0)$ b) $y = x^2 - 6x + 9$
c) Substitute the coordinates into the left and right sides of the equation.

$$\begin{aligned} \text{L.S.} &= x^2 - 6x + 9 & \text{R.S.} &= y \\ &= 3^2 - 6(3) + 9 & &= 0 \\ &= 9 - 18 + 9 & & \\ &= 0 & & \end{aligned}$$

$$\text{L.S.} = \text{R.S.}$$

8. the square, by 9 cm^2

9. a) $16x^4 + 24x^2y^2 + 9y^4$ b) $9x^4 - 4y^4$
c) $-6x + 18$ d) $13b^2 - 6b + 6$
e) $9x^4 + 30x^3 - 19x^2 - 10x + 1$
f) $8x^3 - 36x^2 + 54x - 27$