Practice Exercises

Cube each binomial.

1. $(x+5)^3$
2. $(a-3b)^3$
3. $(4h^2+2k)^3$
4. $(-3x-2y)^3$
5. $(5m+2n^2)^3$

B. Fill in the blanks.

1. $(x-3y)^3 = x^3 - \_\_\_\_ + 27xy^2 - \_\_\_\_$
2. $(2x+z^2)^3 = 8x^3 + \_\_\_\_ + \_\_\_\_ + z^6$
3. $(-3t^2-2y^3)^3 = -27t^6 - \_\_\_\_ - 36t^2y^6 - \_\_\_\_$
4. $(-xy^2+3z^2)^3 = \_\_\_\_ + 9x^2y^4z^2 - \_\_\_\_ + 27z^6$

5. $(x^2y^3 - 2z^3)^3 = x^6y^9 - \_\_\_\_ + \_\_\_\_ - 8z^9$

Problem Set

A. Cube each binomial.

1. $(2m+3r)^3$
2. $(-4a-c)^3$
3. $(3h^2-2i)^3$
4. $(5x+3y)^3$
5. $(2m-4n^3)^3$

B. Fill in the blanks.

1. $(2x-y)^3 = 8x^3 - \_\_\_\_ + \_\_\_\_ - y^3$
2. $(3x+z^3)^3 = \_\_\_\_ + \_\_\_\_ + 9xz^6 + z^9$
3. $(-2t^2-y^3)^3 = -8t^6 - \_\_\_\_ - \_\_\_\_ - y^9$
4. $(-3xy^2+z^2)^3 = -27x^3y^6 + \_\_\_\_ - \_\_\_\_ + z^6$

5. $(3x^3y^2 - 2z^2)^3 = \_\_\_\_ - \_\_\_\_ + 36x^3y^2z^4 - 8z^6$

Problem Set

A.

1. $(2m+3r)^3$

$= (2m)^3 + 3(2m)^2(3r) + 3(2m)(3r)^2 + (3r)^3$

$= 8m^3 + 9r(4m^2) + 6m(9r^2) + 27r^3$

$= 8m^3 + 36rm^2 + 54mr^2 + 27r^3$

2. $(-4a-c)^3$

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

$= -64a^3 - 3c(16a^2) - 12a(c^2) - c^3$

$= -64a^3 - 48a^2c - 12ac^2 - c^3$

3. $(3h^2-2i)^3$

$= (3h^2)^3 + 3(3h^2)^2(-2i) + 3(3h^2)(-2i)^2 + (-2i)^3$

$= 27h^6 - 6i(9h^4) + 9h^2(4i^2) - 8i^3$

$= 27h^6 - 54ih^4 + 36h^2i^2 - 8i^3$

4. $(5x+3y)^3$

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

$= 125x^3 + 9y(25x^2) + 15x(9y^2) + 27y^3$

$= 125x^3 + 225x^2y + 135xy^2 + 27y^3$

5. $(2m-4n^3)^3$

$= (2m)^3 + 3(2m)^2(-4n^3) + 3(2m)(-4n^3)^2 + (-4n^3)^3$

$= 8m^3 - 12n^3(4m^2) + 6m(16n^6) - 64n^9$

$= 8m^3 - 48m^2n^3 + 96mn^6 - 64n^9$

B.

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

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

$= 8x^3 - 12x^2y + 6xy^2 - y^3$

Missing terms = $12x^2y$, $6xy^2$

2. $= (3x)^3 + 3(3x)^2(z^3) + 3(3x)(z^3)^2 + (z^3)^3$

$= 27x^3 + 3z^3(9x^2) + 9x(z^6) + z^9$

$= 27x^3 + 27x^2z^3 + 9xz^6 + z^9$

Missing terms = $27x^3$, $27x^2z^3$

3. $= (-2t^2)^3 + 3(-2t^2)^2(y^3) + 3(-2t^2)(y^3)^2 + (y^3)^3$

$= -8t^6 + 3y^3(4t^4) - 6t^2(y^6) + y^9$

$= -8t^6 - 12t^4y^3 - 6t^2y^6 - y^9$

Missing terms = $12t^4y^3$, $6t^2y^6$

4. $= (-3xy^2)^3 + 3(-3xy^2)^2(z^2) + 3(-3xy^2)(z^2)^2 + (z^2)^3$

$= -27x^3y^6 + 3z^2(9x^2y^4) - 9xy^2(z^4) + z^6$

$= -27x^3y^6 + 27x^2y^4z^2 - 9xy^2z^4 + z^6$

Missing terms = $27x^2y^4z^2$, $9xy^2z^4$

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

$= 27x^9y^6 - 6z^2(9x^6y^4) + 9x^3y^2(4z^4) - 8z^6$

$= 27x^9y^6 - 54x^6y^4z^2 + 36x^3y^2z^4 - 8z^6$

Missing terms = $27x^9y^6$, $54x^6y^4z^2$