

Find the sum or difference.

1. $(6w^3 + 2w^2 - 3w - 1) + (-5w^3 + 9w - 8)$

$$\boxed{w^3 + 2w^2 + 6w - 9}$$

2. $(-x^4 + x^2 - x - x^3 + 1) + (x^2 - 2x^3 + 4x - 1)$

$$\boxed{-x^4 - 3x^3 + 2x^2 + 3x}$$

3. $(4m^4 - m^2 + 5m) \oplus (+2m^3 \oplus m^2 + 2m \oplus 6)$

$$\boxed{4m^4 + 2m^3 - 2m^2 + 7m - 6}$$

4. $(b^4 + 10b) \oplus (4b^3 \oplus 6b^2 + b \oplus 5)$

$$\boxed{b^4 - 4b^3 - 6b^2 + 11b - 5}$$

Find the product.

9. 5. $(2p + 1)(6p^2 - p + 8)$

$$12p^3 - 2p^2 + 16p + 6p^2 - p + 8$$

$$\boxed{12p^3 + 4p^2 + 15p + 8}$$

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

$$-x^4 - 6x^3 + 2x^2 + 3x^2 + 18x - 6$$

$$\boxed{-x^4 - 6x^3 + 5x^2 + 18x - 6}$$

7. $(5q + 2)(-8q + 1)(q - 4)$

$$(-40q^2 + 5q - 16q + 2)(q - 4)$$

$$(-40q^2 - 11q + 2)(q - 4)$$

$$-40q^3 + 160q^2 - 11q^2 + 44q + 2q - 8$$

$$\boxed{-40q^3 + 149q^2 + 46q - 8}$$

Factor the polynomial completely and find the real-number solutions.

9. $2a^3 + 432 = 0$

$$2(a^3 + 216) = 0$$

* Sum of cubes
 $a = a$
 $b = 6$

$$2(a + 6)(a^2 - 6a + 36) = 0$$

No real solutions.
(Quadratic Formula)

$$\boxed{a = -6}$$

10. $(3k^3 + 27k)(-7k - 63) = 0$ Factor by grouping

$$3k^2(k + 9) - 7(k + 9) = 0$$

$$(3k^2 - 7)(k + 9) = 0$$

ZPP

$$3k^2 - 7 = 0$$

$$k + 9 = 0$$

$$\frac{3k^2}{3} = \frac{7}{3}$$

$$\boxed{k = -9}$$

$$\sqrt{k^2} = \sqrt{\frac{7}{3}}$$

$$\boxed{k = \pm \sqrt{\frac{7}{3}}}$$

11. $2z^4 - 1250 = 0$

* Diff. of Perf. Squares

$$2(z^4 - 625) = 0$$

$$2(z^2 + 25)(z^2 - 25) = 0$$

$$2(z^2 + 25)(z + 5)(z - 5) = 0$$

ZPP

$$z \neq 0$$

$$z^2 + 25 = 0$$

$$z + 5 = 0$$

$$\sqrt{z^2} = \sqrt{-25}$$

$$\boxed{z = -5}$$

Not Real!

$$z - 5 = 0$$

$$\boxed{z = 5}$$

