

1. Completely factor each of the following by the AC-method.

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

(b) $6x^2 - 13x - 5 =$

(c) $6x^2 - x - 15 =$

(d) $19x + 5x^2 - 4 =$

(e) $2x^2 - 5x + 2 =$

(f) $2x + 3x^2 - 5 =$

(g) $3x^2 - 5x - 8 =$

2. Completely factor each of the following. (You may need to factor out the GCF before applying the AC-method.)

(a) $30x - 5x^2 - 40 =$

(b) $4x^3 - 2x^2 - 2x =$

(c) $5 - 2x^2 - 9x =$

(d) $7x^2 + 3x^3 - 4x^4 =$

(e) $30 - x^2 - 7x =$

3. Completely factor each of the following. (Mixed exercises.)

(a) $75a - 3a^7 =$

(b) $4ax^2 - 50b - 25a + 8bx^2 =$

(c) $3k^7 - 3k^8 - 6k^9 =$

(d) $7(2x + 1) - 2a^2(2x + 1) - 5a(2x + 1) =$

(e) $80ab^2 - 5a^5b^2 =$

(f) $3am^2y^4 - 3am^2x^4 - 12an^2x^4 + 12an^2y^4 =$

(g) $9x^4 + 13x^5 - 10x^6 =$

(h) $98 - 2x^{10} =$

(i) $m^2 - 4n^2 - a^2m^2 + 4a^2n^2 =$

(j) $p^2(x^2 - 9) - 3p(x^2 - 9) + 2(x^2 - 9) =$

4. Word Problems

(a) One number is 3 less than twice the other. The product of the two numbers is 104. Find these numbers.

(b) The difference between two numbers is 7, their product is 228. Find these numbers.

(c) One side of a rectangle is 4 in shorter than 3 times the other side. Find the sides of the rectangle if its area is 319 in².

Answers

1. Completely factor each of the following by the AC-method.

- (a) $2x^2 - x - 3 = (2x - 3)(x + 1)$
- (b) $6x^2 - 13x - 5 = (2x - 5)(3x + 1)$
- (c) $6x^2 - x - 15 = (3x - 5)(2x + 3)$
- (d) $19x + 5x^2 - 4 = (x + 4)(5x - 1)$
- (e) $2x^2 - 5x + 2 = (2x - 1)(x - 2)$
- (f) $2x + 3x^2 - 5 = (x - 1)(3x + 5)$
- (g) $3x^2 - 5x - 8 = (x + 1)(3x - 8)$

2. Completely factor each of the following. (You may need to factor out the GCF before applying the AC-method.)

- (a) $30x - 5x^2 - 40 = -5(x - 2)(x - 4)$
- (b) $4x^3 - 2x^2 - 2x = 2x(2x + 1)(x - 1)$
- (c) $5 - 2x^2 - 9x = -(x + 5)(2x - 1)$
- (d) $7x^2 + 3x^3 - 4x^4 = -x^2(4x - 7)(x + 1) =$
- (e) $30 - x^2 - 7x = -(x + 10)(x - 3)$

3. Completely factor each of the following. (Mixed exercises.)

- (a) $75a - 3a^7 = -3a(a^3 - 5)(a^3 + 5)$
- (b) $4ax^2 - 50b - 25a + 8bx^2 = (a + 2b)(2x - 5)(2x + 5)$
- (c) $3k^7 - 3k^8 - 6k^9 = -3k^7(2k - 1)(k + 1)$
- (d) $7(2x + 1) - 2a^2(2x + 1) - 5a(2x + 1) = -(2x + 1)(a - 1)(2a + 7)$
- (e) $80ab^2 - 5a^5b^2 = -5ab^2(a^2 + 4)(a + 2)(a - 2)$
- (f) $3am^2y^4 - 3am^2x^4 - 12an^2x^4 + 12an^2y^4 = -3a(x + y)(x - y)(x^2 + y^2)(4n^2 + m^2)$
- (g) $9x^4 + 13x^5 - 10x^6 = -x^4(5x - 9)(2x + 1)$
- (h) $98 - 2x^{10} = -2(x^5 + 7)(x^5 - 7)$
- (i) $m^2 - 4n^2 - a^2m^2 + 4a^2n^2 = (a + 1)(a - 1)(2n + m)(2n - m)$
- (j) $p^2(x^2 - 9) - 3p(x^2 - 9) + 2(x^2 - 9) = (x + 3)(x - 3)(p - 2)(p - 1)$

4. Word Problems

- (a) One number is 3 less than twice the other. The product of the two numbers is 104. Find these numbers. $8, 13$ and $-\frac{13}{2}, -16$
- (b) The difference between two numbers is 7, their product is 228. Find these numbers. $12, 19$ and $-19, -12$
- (c) One side of a rectangle is 4 in shorter than 3 times the other side. Find the sides of the rectangle if its area is 319 in². 11 in by 29 in