Brackets: Expanding

Example: $(x+1)(x+2)(x+3)$

Questions

1. Expand and simplify

$$(x+5)(x-2)(x+1)$$

2. Expand and simplify:

$$2(x-3)(x-4)$$

3. Expand and simplify:

$$(2x-1)^3$$

Extension

[MAT 2002 1B]

Of the following three alleged algebraic identities, at least one is wrong.

(i) $yz(z-y)+zx(x-z)+xy(y-x)$
$=(z-y)(x-z)(y-x)$

(ii) $yz(z-y)+zx(x-z)+xy(y-x)$
$=(z-y)(z-x)(y-x)$

(iii) $yz(x+y)+zx(z+x)+xy(y+x)$
$=(z+y)(z+x)(y+x)$

Which of the following statements are correct? Tick all that apply.

- [ ] (i)
- [ ] (ii)
- [ ] (iii)

[MAT 2007 1E]

If x and n are integers then

$$(1-x)^n(2-x)^{2n}(3-x)^{3n}(4-x)^{4n}(5-x)^{5n}$$

is:

- negative when $n>5$ and $x<5$
- negative when n is odd and $x>5$
- negative when n is a multiple of 3 and $x>5$
- negative when n is even and $x<5$

Brackets: Factorising

Examples:

1. $x^2 - 5x - 14$

2. $2x^2 + 5x - 12$

3. $4x^2 - 9$

4. $x^3 - x$

5. $x^3 + 3x^2 + 2x$

Test your understanding: Factorise completely

1. $6x^2 + x - 2$

2. $x^3 - 7x^2 + 12x$

3. $x^4 - 1$

4. $x^3 - 1$