

Factorising Polynomials

$$(x + 1)$$

$$(x + 2)$$

$$(x + 3)$$

$$(x - 1)$$

$$(x - 2)$$

$$(x - 3)$$

Use combinations of the factors above to make the polynomials below...

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

2. $x^3 + x^2 - 4x - 4$

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

4. $x^3 - 4x^2 + 5x - 2$

5. $x^3 + 2x^2 - 5x - 6$

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

7. $x^3 - 7x^2 + 16x - 12$

8. $x^3 + 5x^2 - 8x - 12$

9. $x^3 - 3x^2 + 4$

10. $x^3 + 6x^2 + 12x + 8$

PS – one of these polynomials is impossible to make with the factors given.
Which one is it?

Factorising Polynomials - Answers

$$(x + 1)$$

$$(x + 2)$$

$$(x + 3)$$

$$(x - 1)$$

$$(x - 2)$$

$$(x - 3)$$

Use combinations of the factors above to make the polynomials below...

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

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

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

$$4. x^3 - 4x^2 + 5x - 2 = (x - 1)(x - 1)(x - 2) = (x - 2)(x - 1)^2$$

$$5. x^3 + 2x^2 - 5x - 6 = (x + 3)(x - 2)(x + 1)$$

$$6. x^3 + 4x^2 + x - 6 = (x + 3)(x + 2)(x - 1)$$

$$7. x^3 - 7x^2 + 16x - 12 = (x - 3)(x - 2)(x - 2) = (x - 3)(x - 2)^2$$

$$8. x^3 + 5x^2 - 8x - 12 = (x + 6)(x - 2)(x + 1)$$

$$9. x^3 - 3x^2 + 4 = (x + 1)(x - 2)(x - 2) = (x + 1)(x - 2)^2$$

$$10. x^3 + 6x^2 + 12x + 8 = (x + 2)(x + 2)(x + 2) = (x + 2)^3$$

PS – one of these polynomials is impossible to make with the factors given.
Which one is it?

Harder Factorising Polynomials

$(x + 1)$

$(x + 2)$

$(3x + 1)$

$(3x + 2)$

$(x - 1)$

$(x - 2)$

$(3x - 1)$

$(3x - 2)$

$(x + 3)$

$(2x - 1)$

$(2x + 3)$

$(3x + 4)$

Use combinations of the factors above to make the polynomials below...

1. $3x^3 - 10x^2 + 9x - 2$

2. $3x^3 - 8x^2 + 7x - 2$

3. $3x^3 + x^2 - 12x - 4$

4. $3x^3 - x^2 - 8x - 4$

5. $3x^3 + 4x^2 - 3x - 4$

6. $3x^3 + 10x^2 - 9x - 4$

7. $2x^3 + 9x^2 + 7x - 6$

8. $2x^3 + 5x^2 - x - 6$

9. $8x^3 - 12x^2 + 6x - 1$

PS – one of these polynomials is impossible to make with the factors given.
Which one is it?

Harder Factorising Polynomials - Answers

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

Use combinations of the factors above to make the polynomials below...

- $3x^3 - 10x^2 + 9x - 2 = (3x - 1)(x - 1)(x - 2)$
- $3x^3 - 8x^2 + 7x - 2 = (3x - 2)(x - 1)(x - 1) = (x - 1)^2(3x - 2)$
- $3x^3 + x^2 - 12x - 4 = (3x + 1)(x + 2)(x - 2)$
- $3x^3 - x^2 - 8x - 4 = (3x + 2)(x - 2)(x + 1)$
- $3x^3 + 4x^2 - 3x - 4 = (3x + 4)(x - 1)(x + 1)$
- $3x^3 + 10x^2 - 9x - 4 = (3x + 1)(x + 4)(x - 1)$
- $2x^3 + 9x^2 + 7x - 6 = (2x - 1)(x + 2)(x + 3)$
- $2x^3 + 5x^2 - x - 6 = (2x + 3)(x - 1)(x + 2)$
- $8x^3 - 12x^2 + 6x - 1 = (2x - 1)(2x - 1)(2x - 1) = (2x - 1)^3$

PS – one of these polynomials is impossible to make with the factors given.
Which one is it?