Products & Factor Theorem

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Write the function below as a polynomial function in standard form.

$$f(x) = (x-1)(x+3)(x+4)$$

FOIL

$$f(x) = (x^2 + 3x - x - 3)(x+4)$$

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

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

$$x^3 + 2x^2 - 3x$$
$$4x^2 + 8x - 12$$
$$x^3 + 6x^2 + 5x - 12$$

Write the function below as a polynomial function in standard form.

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

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

$6x^5 + 20x^4 - 54x^3 - 20x^2$

Write the function below as a polynomial function in standard form.

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

Factor Completely:

$$x^3 - 16x^2 + 64x$$

$x(1x^2 - 16x + 64)$ ① GCF

$x(x - 16)(x - 16)$

64
-8 -8
-16

Factor Completely:

$(x^3+6x^2-5x-30)$

$x^2(x+6)-5(x+6)$

$(x^2-5)(x+6)$

Factor Completely:

$$x^3 - 9x$$

$\times (x^2 - 9)$

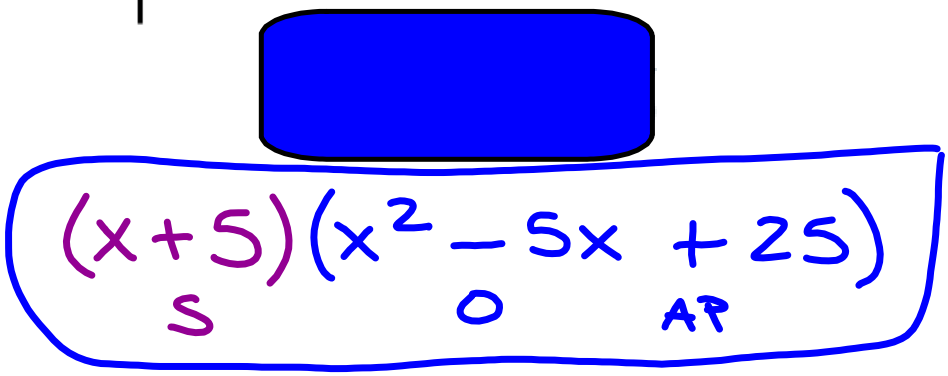
$\times (x+3)(x-3)$

Factoring Perfect Cubes

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

Factor Completely:



Factor Completely:

$$8x^3 - 27$$

$(2x-3)(4x^2+6x+9)$

Factor Theorem

- x – r is a factor of the polynomial expression that defines the function P if and only if r is a solution of P(x)=0, that is if and only if P(r)=0.
- r is a root (zero) iff P(r) = 0

Determine whether $x+3$ is a factor of x^3-2x^2-5x+6

$X+3=0$

$X=-3$

$(-3)^3-2(-3)^2-5(-3)+6$

$-27-18+15+6$

-24

$\therefore$ $X+3$ is Not a factor b/c the answ is not zero

-3	1	-2	-5	6
		-3	15	-30
	1	-5	10	-24