# GCF & Factoring Polynomials of degree greater than 2

$P(x) = x^3 + 5x^2 + 4x$

**Ex:** $P(x) = x(x^2 + 5x + 4)$

$P(x) = x(x+1)(x+4)$

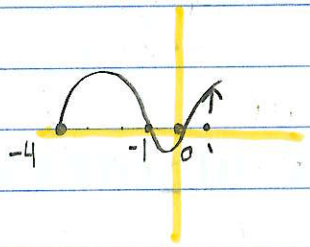
| | x | 4 |
|---|---|---|
| x | $x^2$ | 4x |
| 1 | x | 4 |

x-intercepts:

$x = 0$ $\quad x+1=0$ $\quad x+4=0$

$x = -1$ $\quad x = -4$

$P(1) = 1^3 + 5(1^2) + 4(1) = 10$




• means the y line goes up at 1.

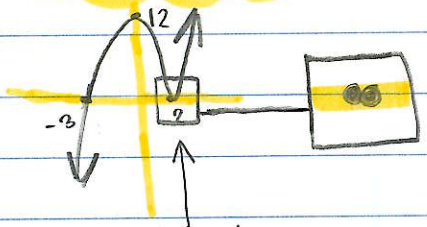
Choose a value that is not an x-intercept

## multiplicity

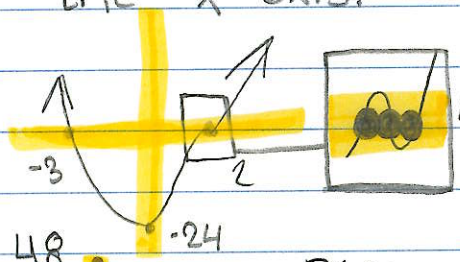
repeated factors

$P(x) = (x-2)(x+3)(x-2)$

$x = 2 \quad x = -3 \quad x = 2$

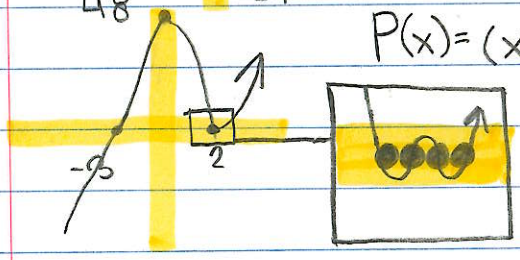



A factor that is repeated twice. Skims the x-axis the bounces off of the x-axis.




multiplicity of 3

$P(x) = (x-2)(x-2)(x-2)(x+3)$




$P(x) = (x-2)(x-2)(x-2)(x-2)(x+3)$

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

Hilroy