

warm-up

2-24

Rewrite in standard form: $f(x) = -2(x+5)^2(x-3)$

Multiply the coefficient (a) by one factor first or by everything last.

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|----|---------|----------|-------|
| -3 | $-3x^2$ | $-30x$ | -75 |
| x | x^3 | $+10x^2$ | $25x$ |
| | x^2 | $+10x$ | $+25$ |

$$f(x) = -2(x^3 + 7x^2 - 9x - 75)$$

$$f(x) = -2x^3 - 14x^2 + 18x + 150$$

Vertical task

Find the x-intercepts (roots) of each polynomial below:

1.

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

2.

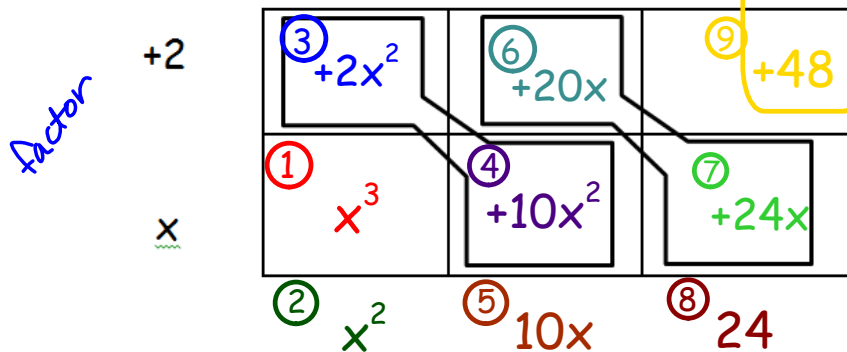
| | | |
|----|---------|------|
| -1 | $-4x$ | -1 |
| 3x | $12x^2$ | $3x$ |
| | 4x | +1 |

3.

| | | |
|----|-------|-------|
| -5 | $-5x$ | 15 |
| x | x^2 | $-3x$ |
| | x | -3 |

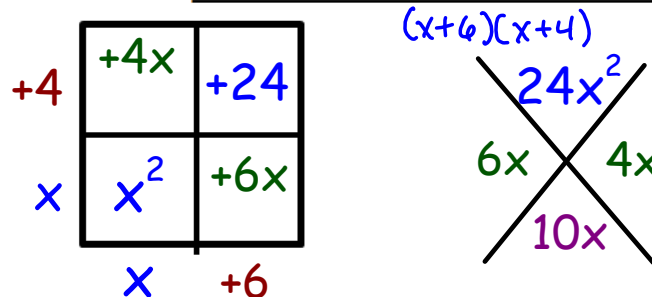
Standard form: $y = x^2 - x - 12$ Standard form: $y = 12x^2 - x - 1$ Standard form: $x^2 - 8x + 15$ Factored form: $y = (x-4)(x+3)$ Factored form: $y = (3x-1)(4x+1)$ Factored form: $y = (x-5)(x-3)$ Roots: $(4,0)$ $(-3,0)$ Roots: $(-\frac{1}{4},0)$ $(\frac{1}{3},0)$ Roots: $(5,0)$ $(3,0)$

Standard form: $y = x^3 + 12x^2 + 44x + 48$ Root: $(-2, 0)$
 if we know one factor is $(x+2)$. ← rewrite it



Partially factored form: $y = (x+2)(x^2+10x+24)$

Partially factored form: $y = (x+2)(x^2+10x+24)$ add multiply



Fully factored form: $y = (x+2)(x+4)(x+6)$

Fully factored form: $y = (x+2)(x+4)(x+6)$

$x+6=0$
 $x=-6$

Roots: $(-2,0)$ $(-4,0)$ $(-6,0)$

Sketch:

