

Grab Starter # 3

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Calendar Math


Basic Form:
 Quadratic: $f(x) = a(x-h)^2 + k$
 Square Root: $f(x) = \sqrt{x-h} + k$
 Absolute Value: $f(x) = a|x-h| + k$

a: Vertical stretch/shrink
 $|a| > 1$ vertical stretch
 $|a| < 1$ vertical shrink

h: Horizontal shift
 $(x-h)$ moves to the right
 $(x+h)$ moves to the left

k: Vertical shift
 $+k$ moves up
 $-k$ moves down

Reflection: negative in front reflects the graph over the x-axis



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How did the function transform?

$a(x-h)^2 + k$

Example 1: $y = -(x-3)^2 + 5$
 $a: -1$ $h: 3$ $k: 5$
 moves to the right 3
 up 5

Example 2: $-|x+2| - 4$
 $a: -1$ $h: -2$ $k: -4$
 reflect over x-axis
 left 2 down 4

Example 3: $y = \sqrt{x-1} + 4$
 $h: 1$ $k: 4$
 right 1
 up 4

$a|x-h| + k$

$\sqrt{x-h} + k$

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Homework Questions...

#14 $10a^3 - 19a^2 - 30a$

GCF: a

$a(10a^2 - 19a - 30)$

$10a^3 : 25 \cdot a \cdot a \cdot a$
 $-19a^2 : -1 \cdot 19 \cdot a \cdot a$
 $-30a : -1 \cdot 30 \cdot a$

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17) $9x^3 + 16x^2 + 3x$

GCF: x

$x(9x^2 + 16x + 3)$

$9x^3 : 3 \cdot 3 \cdot x \cdot x$
 $16x^2 : 4 \cdot 4 \cdot x$
 $3x : 3 \cdot x$

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16) $16v^2 + 28v - 48$

GCF: 4

$4(4v^2 + 7v - 12)$

$16v^2 \div 4 = 4v^2$
 $28v \div 4 = 7v$
 $-48 \div 4 = -12$

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1.3 Factoring Trinomials

GCF- The biggest number or term they have in common.

Trinomial- The GCF must be a factor of EVERY term in the polynomial.

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Factor Diagram

$3 \cdot 4 = 12$

↑ ↑
Factors Product

3 and 4 are factors of 12.

An Algebra Example:

$(x+2)(x+3) = x^2 + 5x + 6$

↑ ↑
Factors Product (Polynomial)

$(x+2)$ and $(x+3)$ are factors of the polynomial $x^2 + 5x + 6$.

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Steps for factoring a trinomial:

1. Look at the coefficients ^{what #s}
2. Look at the variables ^{x, y, k, 0}
3. Identify the GCF
4. Write in factored form

Chart for when factoring a trinomial:

If you start with this...	Factor like this...
$x^2 + bx + c$	$(x + \text{big \#})(x + \text{small \#})$
$x^2 - bx + c$	$(x - \text{big \#})(x - \text{small \#})$
$x^2 + bx - c$	$(x + \text{big \#})(x - \text{small \#})$
$x^2 - bx - c$	$(x - \text{big \#})(x + \text{small \#})$

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Examples

1) $x^2 + 9x + 20$

$a \cdot 1$ $b \cdot 9$ $c \cdot 20$

$\frac{20}{4 \times 5}$

$\frac{20}{4 \times 5}$

$(x+5)(x+4)$

$\begin{array}{r|l} x & 4 \\ \hline x^2 & +4x \\ 5 & 5x + 20 \end{array}$

$x^2 + 5x + 4x + 20$
 $x^2 + 9x + 20$

$a \cdot c$
~~Factors $a \cdot c = +/-$
 b~~ Factors $a \cdot c = +/-$
 b

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3) $4k^2 + 4k - 24$

GCF: 4

$4(k^2 + k - 6)$

$a \cdot 1$ $b \cdot 1$ $c \cdot -6$

$\frac{-6}{-2 \times 3}$ $\frac{-6}{2 \times 3}$

$4(k+3)(k-2)$

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5 $5x^2 - 18x + 16$
 $a \cdot 5$ $b \cdot -18$ $c = 16$
 ~~$\begin{matrix} 80 \\ -10 & -8 \\ -18 \end{matrix}$~~
 $\begin{matrix} 1 & 80 \\ 2 & 40 \\ 3 & 20 \\ 4 & 10 \\ 5 & 8 \end{matrix}$
 $(5x-10)(5x-8)$
 $\frac{5}{5}$
 $(x-2)(5x-8)$

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b) $7a^2 + 37a + 36$
 $a \cdot 7$ $b \cdot 37$ $c \cdot 36$
 ~~$\begin{matrix} 252 \\ +9 & +28 \\ 37 \end{matrix}$~~
 $\begin{matrix} 1 & 252 \\ 2 & 126 \end{matrix}$
 $(7a+28)(7a+9)$
 $\frac{7}{7}$
 $(a+4)(7a+9)$

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Homework
 12) $18x^2 - 15x - 150$
 $\underline{3 \text{ GCF}}$ $3(bx^2 - 5x - 50)$
 ~~$\begin{matrix} -300 \\ -20 & +15 \\ -5 \end{matrix}$~~
 $3 \left(\frac{bx}{2} - \frac{20}{2} \right) \left(\frac{bx}{3} + \frac{15}{3} \right)$
 $3(3x-10)(2x+5)$

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