

# Algebra 1

## Chapter 8

### Section 8-6

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#### Review: Factoring a Polynomial

$$12x - 15$$

$$\text{GCF: } 3$$

$$3(4x - 5)$$

$$\downarrow$$
$$x^2 - 15x + 50$$

$$\frac{50}{-10, -5 = -15}$$

$$(x - 10)(x - 5)$$

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## Review: Factoring a Polynomial

$$9x^3 - 21x^2$$

$$3x^2(3x-7)$$

$$6x - 14$$

$$2(3x-7)$$

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Factoring by Grouping

$$9x^3 - 21x^2 + 6x - 14$$

$$\underline{3x^2(3x-7)} + \underline{2(3x-7)}$$

$$\text{GCF: } (3x-7)$$

$$(3x-7)(3x^2+2)$$

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## Factoring by Grouping

$$3x^3 + 6x^2 + 5x + 10$$
$$3x^2(\underline{x+2}) + 5(\underline{x+2})$$

$$\text{GCF: } (x+2)$$
$$(x+2)(3x^2+5)$$

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## Factoring a trinomial

SPECIAL CASE:

$$ax^2 + bx + c$$

What two numbers have a product of  $a \cdot c$  and a sum of  $b$ ?

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## Factoring a trinomial (continued)

$$3x^2 + 7x + 2$$

What two numbers have a product of 6 and a sum of 7?

1 and 6

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## Factoring a trinomial (continued)

$$3x^2 + 7x + 2$$

$$3x^2 + 6x + 1x + 2$$

$$3x(\underline{x+2}) + 1(\underline{x+2})$$

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

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## Factoring a trinomial

$\underline{7}x^2 + 16x + \underline{4}$ $7 \cdot 4 = \underline{28}$ <div style="margin-left: 40px;"> <math>1, 28</math>  <math>2, 14</math> </div> $7x^2 + 16x + 4$ $7x^2 + 14x + 2x + 4$ $\underline{7x(x+2)} + \underline{2(x+2)}$ $(x+2)(7x+2)$	}	$5t^2 + 4t - 12$ $5(-12) = \underline{-60}$ <div style="margin-left: 40px;"> <math>-1, 60</math>  <math>-2, 30</math>  <math>-3, 20</math>  <math>-4, 15</math>  <math>-5, 12</math>  <math>-6, 10</math> </div> $5t^2 + 4t - 12$ $5t^2 + 10t - 6t - 12$ $\underline{5t(t+2)} - \underline{6(t+2)}$ $(t+2)(5t-6)$
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## Factoring a trinomial

$2v^2 - \underline{31}v - 16$ $2 \cdot (-16) = \underline{-32}$ <div style="margin-left: 40px;"> <math>1, -32</math> </div> $2v^2 - 31v - 16$ $2v^2 + v - 32v - 16$ $v(2v+1) - 16(2v+1)$ $(2v+1)(v-16)$	}	$4y^2 - 17y + 18$ $4 \cdot 18 = \underline{72}$ <div style="margin-left: 40px;"> <math>-1, -72</math>  <math>-2, -36</math>  <math>-3, -24</math>  <math>-4, -18</math>  <math>-6, -12</math>  <math>-8, -9</math> </div> $4y^2 - 17y + 18$ $4y^2 - 8y - 9y + 18$ $\underline{4y(y-2)} - \underline{9(y-2)}$ $(y-2)(4y-9)$
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