

Feb 5/2019

## Review - Part 2

### Solving Systems of Equations

### Expanding & Simplifying Quadratic Relations

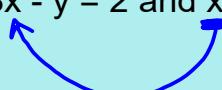
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The solution to a linear system is the point  $(x,y)$  where the lines intersect.

Three methods to solve:

1. Graphically
2. By substitution
3. By elimination

Ex.1 Substitution: Solve  $3x - y = 2$  and  $x = y - 2$



Ex.2 Elimination: Solve  $5x + 2y = 5$  and  $3x - 4y = -23$

$$\textcircled{1} \times 3 : 15x + 6y = 15$$

$$\textcircled{2} \times 5 : \underline{15x - 20y = -115}$$

$$3x - 4y = -23$$

$$\begin{array}{r} 15x + 6y = 15 \\ - \\ \hline 10x - 26y = -138 \end{array}$$

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Ex.1 Substitution: Solve  $3x - y = 2$  and  $x = y - 2$

Sub the x-value from the second equation into the first equation

$$\textcircled{1} \quad 3x - y = 2 \quad \textcircled{2} \quad x = \underline{y - 2}$$

Sub  $\textcircled{2}$  into  $\textcircled{1}$

$$\textcircled{1}: \quad 3(y - 2) - y = 2$$

$$3y - 6 - y = 2$$

$$2y - 6 = 2$$

$$2y = 8$$

$$y = 4$$

Sub  $y = 4$  into  $\textcircled{2}$

$$x = 4 - 2$$

$$x = 2$$

$\therefore$  Solution is  
 $(2, 4)$

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Ex.2 Elimination: Solve  $5x + 2y = 5$  and  $3x - 4y = -23$

Match coefficients of the x-term or y-term, then add or subtract equations

$$\textcircled{1} \times 2: \quad 10x + 4y = 10$$

$$\textcircled{2}: \quad 3x - 4y = -23$$

$$\text{add: } 13x = -13$$

$$\boxed{x = -1}$$

Sub  $x = -1$  into  $\textcircled{1}$  or  $\textcircled{2}$

$$5(-1) + 2y = 5$$

$$-5 + 2y = 5$$

$$2y = 10$$

$$\boxed{y = 5}$$

$\therefore$  Solution is  
 $(-1, 5)$

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Expanding two binomials  
(a) distributive property

$$\begin{aligned}(a+b)(c+d) \\ = a(c+d) + b(c+d) \\ = ac + ad + bc + bd\end{aligned}$$

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Expanding two binomials  
(b) distributive property (using FOIL)

$$\begin{aligned}(a+b)(c+d) &\quad \text{First} \\ = ac + ad + bc + bd &\quad \text{Outer} \\ &\quad \text{Inner} \\ &\quad \text{Last}\end{aligned}$$

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Expanding two binomials

(c) area model

$$(a+b)(c+d) = ac + ad + bc + bd$$

	$a + b$
$c$	$ac$
$+d$	$ad$

$bc$	$bd$
------	------

$$(3x+2y+5)(2x-7y)$$

$3x + 2y + 5$	
$2x$	$6x^2$
$-7y$	$4xy$

$10x$	
$-21xy$	$-14y^2$
$-35y$	

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Ex.1 Expand each of the following:

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

$$= 2x^2 - 3x + 8x - 12$$

$$= 2x^2 + 5x - 12$$

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

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

$$= 4x^2 - 6x - 6x + 9$$

$$= 4x^2 - 12x + 9$$

(c)  $(3x-2y)(x+5y)$

$$= 3x^2 + 13xy - 10y^2$$

$x + 5y$	
$3x$	$3x^2$

$-2y$	$15xy$
$-2xy$	$-10y^2$

(d)  $3(2x-5y)(2x+5y)$

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Homework:

p.29 # 1acf, 2ace  
 p.31 # 8ac, 9ace, 10ae  
 p.33 # 11ace, 12ace, 13ace

Tomorrow's Work:

p.3 # 4odd, 5odd, 6odd

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$$\begin{aligned}
 & \text{P 31 9(e)} \\
 & 3(2x-9) - 3 - 1(4x+1) + 2 \\
 & = 6x - 27 - 3 - 4x - 1 + 2 \\
 & = 2x - 29
 \end{aligned}$$

$$\begin{aligned}
 & \text{10(e)} \quad 2x[x + 2(x-3)] - x(3x-4) \\
 & = 2x[x + 2x - 6] - 3x^2 + 4x \\
 & = 2x[3x - 6] - 3x^2 + 4x \\
 & = 6x^2 - 12x - 3x^2 + 4x \\
 & = 3x^2 - 8x
 \end{aligned}$$

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P. 33 13c e

$$(c) \quad 2(x-4)(x+3) + 5(2x-1)(x+6)$$

$$= 2(x^2 + 3x - 4x - 12) + 5(2x^2 + 12x - x - 6)$$

$$= 2x^2 - 2x - 24 + 10x^2 + 55x - 30$$

$$= 12x^2 + 53x - 54$$

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$$13(e) \quad 2(m-3)(m-4) - 3(m+5)^2$$

$$= 2(m-3)(m-4) - 3(m+5)(m+5)$$

$$= 2(m^2 - 7m + 12) - 3(m^2 + 10m + 25)$$

$$= 2m^2 - 14m + 24 - 3m^2 - 30m - 75$$

$$= -m^2 - 44m - 51$$

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