

7.3 p. 505
ex 44

$$y + 2x = 6 \rightarrow 2x + y = 6$$

$$x - 3y = -4 \quad x - 3y = -4$$

intersecting lines

ex 32

$$2x - y = 4$$

$$4x - 2y = 8$$

same equation
same line

ex 50

$$3x + 2y = 5$$

$$6x + 4y = 3$$

different relationship

multiples of one another

same slopes & different y intercepts
parallel lines

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7.4 p. 512 Substitution

ex 6

$$x + 3y = -28$$

$$y = -5x$$

$$x + 3(-5x) = -28$$

$$x - 15x = -28$$

$$\frac{-14x}{-14} = \frac{-28}{-14}$$

$$x = 2$$

$$y = -5x$$

$$y = -5(2)$$

$$y = -10$$

(2, -10)

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ex 8

$$4x + 3y = -5$$

$$x = y - 3$$

$$x = y - 3$$

$$x = 1 - 3$$

$$x = -2$$

$$4(y-3) + 3y = -5$$

$$4y - 12 + 3y = -5$$

$$7y - 12 = -5$$

$$7y = 7$$

$$y = 1$$

$$(-2, 1)$$

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ex 10

$$2x - 5 = -y$$

$$x + 3y = 0$$

$$-2x + 5 = y$$

$$x + 3(-2x + 5) = 0$$

$$x - 6x + 15 = 0$$

$$-5x = -15$$

$$x = 3$$

$$-2(3) + 5 = y$$

$$-6 + 5 = y$$

$$-1 = y$$

$$(3, -1)$$

$$x = -3y$$

$$2(-3y) - 5 = -y$$

$$-6y - 5 = -y$$

$$-5 = 5y$$

$$-1 = y$$

$$x = -3y$$

$$x = -3(-1)$$

$$x = 3 \quad (3, -1)$$

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ex 18

$$x + y = 0 \quad y$$

$$x = -y$$

$$4x + 2y = 3$$

$$4(-y) + 2y = 3$$

$$-4y + 2y = 3$$

$$-2y = 3$$

$$x = -y$$

$$x = -\left(-\frac{3}{2}\right)$$

$$y = -\frac{3}{2} \text{ or } -1\frac{1}{2}$$

$$x = \frac{3}{2}$$

$$\left(\frac{3}{2}, -\frac{3}{2}\right)$$

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ex 30

$$\frac{1}{4}x - \frac{1}{5}y = 9$$

$$\frac{1}{4}x - \frac{1}{5}(\cancel{5x}) = 9$$

$$y = 5x$$

$$\frac{1}{4}x - x = 9$$

$$x - 4x = 36$$

$$-3x = 36$$

$$x = -12$$

$$y = 5x$$

$$y = 5(-12)$$

$$y = -60$$

$$(-12, -60)$$

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ex 26

$$\frac{8}{1} \left(\frac{1}{2}x - \frac{1}{8}y \right) = \left(-\frac{1}{4} \right) \frac{8}{1}$$

$$\frac{12}{1} \left(\frac{1}{3}x - \frac{1}{12}y \right) = \left(-\frac{1}{6} \right) \frac{12}{1}$$

$$4x + 2 - y = -2 + 2$$

$$4x + 2 = y$$

$$4x - y = -2$$

$$4x - (4x + 2) = -2$$

$$4x - 4x - 2 = -2$$

$$-2 = -2$$

$$\{(x, y) \mid 4x - y = -2\}$$

infinite # of solutions

always true

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ex 20

$$2x + 10y = 3$$

$$2(1 - 5y) + 10y = 3$$

$$x = 1 - 5y$$

$$2 - 10y + 10y = 3$$

$$2 = 3$$

no solution

always false

$$\emptyset \quad \{ \}$$

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7.5 p. 518

Eliminationex 4

$$x + y = 10$$

$$x + y = 10$$

add

$$x - y = -6$$

$$2 + y = 10$$

$$\underline{2x = 4}$$

$$y = 8$$

$$x = 2$$

$$(2, 8)$$

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$$x + y = 10 \longrightarrow x + y = 10$$

$$x - y = -6 \xrightarrow{\cdot(-1)} \xrightarrow{\text{add}} \underline{-x + y = 6}$$

$$2y = 16$$

$$y = 8$$

$$x - y = -6$$

$$x - 8 = -6$$

$$x = 2 \quad (2, 8)$$

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ex 8

$$5x = y + 5 \longrightarrow 5x = y + 5$$

$$\begin{array}{r} -5x + 2y = 0 \\ \quad -2y \quad -2y \end{array} \quad \begin{array}{r} \text{add } -5x = -2y \\ \hline 0 = -y + 5 \\ y = 5 \end{array}$$

$$5x = y + 5$$

$$5x = 5 + 5 \quad (2, 5)$$

$$5x = 10$$

$$x = 2$$

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ex 12

$$x + y = 3 \xrightarrow{\cdot 3} 3x + 3y = 9$$

$$\begin{array}{r} -3x + 2y = -19 \\ \text{add} \quad \hline 5y = -10 \\ y = -2 \end{array}$$

$$x + y = 3$$

$$x - 2 = 3 \quad (5, -2)$$

$$x = 5$$

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ex 34

$$\begin{array}{r} .5x + 3.4y = 13 \\ (-30) \cdot 1.5x - 2.6y = -25 \\ \rightarrow -15x - 102y = -390 \quad \cdot 10 \\ \text{add} \quad 15x - 26y = -250 \\ \hline -128y = -640 \\ y = 5 \quad -15x - 102y = -390 \\ \quad \quad -15x - 102(5) = -390 \\ \quad \quad -15x - 510 = -390 \\ \quad \quad \quad +510 \quad +510 \\ \quad \quad -15x = 120 \\ \quad \quad \quad X = -8 \end{array}$$

$(-8, 5)$

$$.5x + 3.4y = 13$$

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$$S = 1 + 2 + 3 + \dots + 97 + 98 + 99 + 100$$

$$S = 100 + 99 + 98 + \dots + 4 + 3 + 2 + 1$$

$$2S = 101 + 101 + 101 + \dots + 101 + 101 + 101 + 101$$

100

$$\frac{2S}{2} = \frac{101 \cdot 100}{2} = \frac{10100}{2} = 5050$$

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