

$$y = mx + \frac{c}{m}$$

c

Activity 11

1 $\frac{2x-3}{2}$ where x
No restriction

2 $\frac{x+12}{x-2}$

$x-2 \neq 0$
 $x \neq 2$

3 $\frac{x+4}{x-6}$ $(x-4)(x-6)$

$x^2 - 4x - 6x + 24$
 $x^2 - 10x + 24$

4 689
 $= 42$

5

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5

$$\left(\frac{4x-1}{x^3+9}\right) \left(\frac{x+2}{x-2}\right)$$

$$(a-b)^2 = a^2 - 2ab + b^2$$

$$\frac{4(x-1)}{x^3+9} \left(\frac{x+2}{x-2}\right) = \frac{4(x+2)}{x^3+9}$$

$$= \frac{4x+2}{x^3+9}$$

$$\frac{x^2}{1} \cdot \frac{1}{x} = x$$

$$\frac{x^2-1}{x^2+1} \times \frac{2}{x-1}$$

$$\frac{x^2-1}{x^2+1} = \frac{x-1}{2}$$

$$\frac{(x+1)(x-1)}{(x+1)(x+1)} \left(\frac{2}{x-1}\right)$$

$$(x)(x-1)$$

$$\frac{2x+2}{x^2+1}$$

$$\frac{(x+2)(x-2)(x+3)}{(x^2-9)(x-2)} = \frac{x+2}{x-3}$$

$$x^2+2x-x-2$$

$$x(x+2)-1(x+2)$$

$$(x-1)(x+2)$$

$$\frac{x(x-1)}{3x} \times \frac{12x^2}{(x-1)(x+1)}$$

$$\frac{x(4x)}{x+1} = \frac{4x^2}{x+1}$$

$$x^2-2x-x-2$$

$$\frac{x^2-5x+6}{x^2-4} = \frac{x^2-3x-6}{x^2+4x+4}$$

$$\frac{-1}{x^2(x-1)}$$

$$\frac{x^2-5x-x-6}{(x+2)(x-2)} \frac{x^2+2x+2x+4}{x^2-2x+3x-6}$$

$$\frac{-1}{x^2(x-1)}$$

$$\frac{x(x-5)+1(x-6)}{(x+2)(x-2)} \frac{x(x+2)}{x(x+2)}$$

$$= \frac{(x+1)(x-6)}{(x+2)(x-2)} \left(\frac{x+2}{x-6}\right)$$

$$\left(\frac{4x-1}{x^3+9}\right) \left(\frac{x+2}{x-2}\right)$$

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$$\frac{(x+1)(x-1)}{(x+1)(x+1)} \left(\frac{2}{x-1}\right)$$

$$(x)(x-1)$$

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$$x^2+2x-x-2$$

$$\frac{x(x-1)}{3x} \times \frac{12x^2}{(x-1)(x+1)}$$

$$x(x+2)-1(x+2)$$

$$(x-1)(x+2)$$

$$\frac{x(4ax)}{x+1} =$$

$$x^2-2x-x-2$$

$$\frac{x^2-5x+6}{x^2-4} = \frac{x^2-2x-6}{x^2+4x+4}$$

$$\frac{-1}{x^2(x-1)}$$

$$\frac{x^2-5x-x-6}{(x+2)(x-2)} \frac{x^2+2x+2x+4}{x^2-2x+3x-6}$$

$$\frac{-1}{x^2(x-1)}$$

$$\frac{x(x-5)+1(x-6)}{(x+2)(x-2)} \frac{x(x+2)}{x(x+2)}$$

$$= \frac{(x+1)(x-6)}{(x+2)(x-2)} \left(\frac{x+2}{x-6}\right)$$

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

$$35x - 14 + 10x^2 - 4x$$

$$31x + 10x^2 - 14$$

$$31(7) + 10(49) - 14$$

$$(3x-3)$$

$$490 - 14 + 217$$

$$g(x) = x + 1$$

$$-1-1$$

$$= -2$$

$$-2-3$$

$$-5$$

$$-10+7$$

$$-4+57$$

$$3$$

$$5x-4$$

$$2x-2$$

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

$$2(5x-4)-1$$

$$2x-6+7$$

$$10x-8-1$$

$$2x+1$$

$$10x-9$$

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

$$35x - 14 + 10x^2 - 4x$$

$$31x + 10x^2 - 14$$

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$$g(x) = x + 1$$

$$-1 - 1$$

$$= -2$$

$$-2 - 3$$

$$-5$$

$$-10 + 9$$

$$-4 + 57$$

$$3$$

$$5x - 4$$

$$2x - 2$$

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

$$2(5x-4) - 1$$

$$2x - 6 + 7$$

$$10x - 8 - 1$$

$$2x + 1$$

$$10x - 9$$

$$x^2 - 1 \quad (6)$$

$$\frac{x+y}{x-y} \cdot \frac{x-y}{x-y} \cdot \frac{2x = -1}{1} \cdot \frac{1}{1}$$

$$\frac{x+y}{x-y}$$

$$\frac{x+2x-2}{x^2-x} = 2$$

$$x^2 - x$$

$$x+2x-2 = 2x^2 - 2x$$

$$3x - 2 = 2x^2$$

$$\frac{x}{x-3} = \frac{x+4}{x-1}$$

$$2x^2 - 5x + 2 = 0$$

$$x^2 - x = x - 4x - 3x - 12$$

$$x^2 - x = 7x - 12$$

$$\frac{6x}{6} = \frac{-12}{6}$$

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

$$-x = x = -12$$

$$-2x = -12$$

$$2x^2 - 4x - x + 2 = 0$$

$$2x(x-2) + 1(x-2) = 0$$

$$(2x-1)(x-2)$$

$$x^2 - 1 \quad (6)$$

$$\frac{x+y}{x-y} \cdot \frac{x-y}{x-y} \cdot \frac{2x = -1}{1} \cdot \frac{1}{1}$$

$$\frac{x+y}{x-y}$$

$$\frac{x+2x-2}{x^2-x} = 2$$

$$x^2 - x$$

$$x+2x-2 = 2x^2 - 2x$$

$$3x - 2 = 2x^2$$

$$\frac{x}{x-3} = \frac{x+4}{x-1}$$

$$2x^2 - 5x + 2 = 0$$

$$x^2 - x = x - 1 \quad \text{---} \quad 3x - 12$$

$$x^2 - x = 7x - 12$$

$$\frac{6x}{6} = \frac{-12}{6}$$

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

$$-x = x - 12$$

$$-2x = -12$$

$$2x^2 - 4x - x + 2 = 0$$

$$2x(x-2) + 1(x-2) = 0$$

$$(2x-1)(x-2)$$

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

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

$$= 2x^2 + 5x + 3$$

$$\frac{2x+2+1}{x+1} = 4$$

$$\frac{(x+1)}{(x-1)}$$

$$4x+4 = 2x^2+5x+3$$

$$2x^2+x-1=0$$

$$2x^2-2x-x-1=$$

$$2x(x-1) + 1(x-1)$$

$$\frac{x^2+x+2x=4}{x(x^2+x)} \quad x+1$$

$$\frac{-1)+1}{+1)(x-1)}$$

$$x+1-1$$

$$\frac{x}{x^2-1)}$$

$$\frac{x/(x+1+2)}{x/(x^2+x)} = 4$$

$$(x+1+2)(x+1)=$$

$$4x^2+4x$$

$$\frac{-1}{1} \quad \frac{8+2}{2x}$$

$$\frac{2}{x^2+x+2x+x+4x}$$

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

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

$$= 2x^2 + 5x + 3$$

$$2x+2+1=4$$

$$x+1 \quad x+1$$

$$(x+1)$$

$$(x-1)$$

$$4x+4 = 2x^2 + 5x + 3$$

$$2x^2 + x - 1 = 0$$

$$2x^2 - 2x - x - 1 =$$

$$2x(x-1) + 1(x-1)$$

$$x^2 + x + 2x = 4$$

$$x(x^2 + x) \quad x+1$$

$$x+1-1$$

$$\frac{x}{x^2-1}$$

$$\frac{x(x+1+2)}{x(x^2+x)} = 4$$

$$(x+1+2)(x+1) =$$

$$4x^2 + 4x$$

$$\frac{8+2}{2x}$$

$$\frac{2}{x^2+x+2x+x+4x}$$

$$\frac{4(x+2)}{x^3+8} \cdot \frac{(x+2)}{(x-1)} = \frac{4(x+2)}{x^3+8}$$

$$= \frac{4x+2}{x^3+8}$$

$$\frac{x^2}{1} \cdot \frac{1}{x} = x$$

$$\frac{x^2-1}{x^2+1} \cdot \frac{2}{x-1}$$

$$\frac{x^2-1}{x^2+1} = \frac{x-1}{2}$$

$$\frac{(x+1)(x-1)}{(x+1)(x+1)} \cdot \frac{2}{(x-1)}$$

$$\frac{2x+2}{x^2+1}$$

$$(x)(x-1)$$

$$\frac{(x+2)(x-2)(x-3)}{(x^2-4)(x-3)} = \frac{x+2}{x-3}$$

$$x^2+x-x-2$$

$$\frac{x(x-1)}{3x} \cdot \frac{12x^2}{(x-1)(x+1)}$$

$$\frac{x(40x)}{x+1}$$

$$\frac{x(x+2)-1(x+2)}{(x-1)(x+2)}$$

$$x^2-2x-x-2$$

$$\frac{x^2-5x+6}{x^2-4} = \frac{x^2-x-6}{x^2+4x+4}$$

$$\frac{1}{x(x^2-1)} \cdot \frac{-1}{x^2(x-1)}$$

$$= -1$$

$$\frac{x^2-5x-x-6}{(x+2)(x-2)} \cdot \frac{x^2+2x+2x+4}{x^2-2x+3x-6}$$

$$\frac{x}{(x^2-1)} \cdot \frac{-1}{x^2(x-1)}$$

$$= \frac{-1}{x^3-1}$$

$$\frac{x(x-5)+1(x-6)}{(x+2)(x-2)} \cdot \frac{x(x+2)}{x(x+2)}$$

$$= \frac{(x+1)(x-6)}{(x+2)(x-2)} \cdot \frac{(x+2)}{(x-6)}$$

$$=$$

$$\frac{4(x+2)}{x^3+8} \cdot \frac{(x+2)}{(x-1)} = \frac{4(x+2)}{x^3+8}$$

$$= \frac{4x+2}{x^3+8}$$

$$\frac{x^2}{1} \cdot \frac{1}{x} = x$$

$$\frac{x^2-1}{x^2+1} \cdot \frac{2}{x-1}$$

$$\frac{x^2-1}{x^2+1} = \frac{x-1}{2}$$

$$\frac{(x+1)(x-1)}{(x+1)(x+1)} \cdot \frac{2}{(x-1)}$$

$$\frac{2x+2}{x^2+1}$$

$$(x)(x-1)$$

$$\frac{(x+2)(x-2)(x-3)}{(x^2-4)(x-3)} = \frac{x+2}{x-3}$$

$$x^2+x-x-2$$

$$\frac{x(x-1)}{3x} \cdot \frac{12x^2}{(x-1)(x+1)}$$

$$\frac{x(40x)}{x+1}$$

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$$x^2-2x-x-2$$

$$\frac{x^2-5x+6}{x^2-4} = \frac{x^2-x-6}{x^2+4x+4}$$

$$\frac{1}{x(x^2-1)} \cdot \frac{-1}{x^2(x-1)}$$

$$= -1$$

$$\frac{x^2-5x-x-6}{(x+2)(x-2)} \cdot \frac{x^2+2x+2x+4}{x^2-2x+3x-6}$$

$$\frac{x}{(x^2-1)} \cdot \frac{-1}{x^2(x-1)}$$

$$= \frac{-1}{x^3-1}$$

$$\frac{x(x-5)+1(x-6)}{(x+2)(x-2)} \cdot \frac{x(x+2)}{x(x+2)}$$

$$= \frac{(x+1)(x-6)}{(x+2)(x-2)} \cdot \frac{(x+2)}{(x-6)}$$

$$=$$

Activity 14

$$3x - 6 \leq 4x$$

$$30x - 6 = 4x$$

$$-6 = x$$

$$-6 \leq x$$

Pair 3: Graphing Inequalities

$$5(x+2) - 3x > 7 - 4(x-3)$$

$$5x + 10 - 3x > 7 - 4x + 12$$

$$2x + 10 > 19 - 4x$$

$$6x > 9$$

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

$$x > 1.5$$

Activity 14

$$3x - 6 \leq 4x$$

$$30x - 6 = 4x$$

$$-6 = x$$

$$-6 \leq x$$

Pair 3: Graphing Inequalities

$$5(x+2) - 3x > 7 - 4(x-3)$$

$$5x + 10 - 3x > 7 - 4x + 12$$

$$2x + 10 > 19 - 4x$$

$$6x > 9$$

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

$$x > 1.5$$

Activity 9

$$1 \quad y = x + 2$$

$$x + y = -5 + 2$$

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

$$x = -x - 2 + 2$$

$$x + x = 0$$

$$x = 0$$

$$y = 0 + 2$$

$$= 0 + 2 \quad (0, 2)$$

$$x + 3y = 0 \quad x = -3y$$

$$2x + 2y = 8$$

$$2(-3y) + 2y = 8$$

$$-6y + 2y = 8$$

$$-4y = 8$$

$$y = -2$$

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

$$x = 6$$

$$(6, -2)$$

3

$$2x + y = 4$$

$$3x + y = 1$$

$$y = 1 - 3x$$

$$2x + 1 - 3x = 4$$

$$-x = 4 - 1$$

$$x = -3$$

$$3x + 3 + y = 1$$

$$y = 10$$

$$(-3, 10)$$

$$x - 4y = -3$$

$$2x - 3y = -1$$

$$x = 4y - 3$$

$$2(4y - 3) - 3y = -1$$

$$8y - 6 - 3y = -1$$

$$5y = 5$$

$$y = 1$$

$$x - 4 = -3$$

$$x = 1$$

$$(1, 1)$$

Activity 10

$$1 \quad \begin{aligned} & 2 - (2n + 3) \\ & 2 + 3 - 2n = 10 - 2n \\ & 7 - 2n - 3 \\ & 7 - 9 - 2n = 4 - 2n \end{aligned}$$

$$2 \quad \begin{aligned} & n + 3 - (3 - n) \\ & n + 3 - 3 + n \\ & = 2n \end{aligned} \quad f$$

$$3 \quad \begin{aligned} & f(x) = 2 \\ & g(x) = 7x \\ & 2 + 7x \\ & = 7x + 2 \end{aligned}$$

$$4 \quad \begin{aligned} & (5x - 2) + 2 \\ & 5x - 2 + 2 \\ & = 5x \end{aligned}$$

$$5 \quad \begin{aligned} & (50 + 5m) + (59 + 5m) \\ & 50 + 59 + 5m + 5m \\ & 109 + 10m \end{aligned}$$

Activity 10

$$1 \quad 2 - (2n + 3) \\ 2 + 3 - 2n = 10 - 2n$$

$$7 - 2n - 3 \\ 7 - 3 - 2n = 4 - 2n$$

$$2 \quad n + 3 - (3 - n) \quad f \\ n + 3 - 3 + n \\ = 2n$$

$$3 \quad f(x) = 2 \\ g(x) = 7x \\ 2 + 7x \\ = 7x + 2$$

$$4 \quad (5x - 2) + 2 \\ 5x - 2 + 2 \\ = 5x$$

$$5 \quad (50 + 5m) + (59 + 5m) \\ 50 + 59 + 5m + 5m \\ 109 + 10m$$

$$6z + 12 = -4$$

6+

$$0 + 10 + 9 = 5$$

6+

$$-3 - 16 + 15$$

$$0.5$$

$$-1.12$$

$$\frac{0.5}{-8-0} = \frac{-3}{8}$$

2

5

5

$$(0, 5)$$

$$0.5$$

$$\begin{pmatrix} 10 & 10 \\ 8 & 2 \\ 11 & 0 \end{pmatrix}$$

$$\frac{10-5}{10-0} = \frac{5}{10} = \frac{5}{10}$$

$$x - 2y - 3z = 5$$

$$x + 2y + 3z = 7$$

$$x + z = 3$$

$$x = 3 - z$$

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

$$(3-z) + 2y + 3z = 7$$

$$-3z - 2 - 2y = 5 - 3$$

$$3z - 2 + 2y = 7 - 3$$

$$-4z - 2y = 2$$

$$8z + 2y = 4$$

$$\frac{-2y}{-2} = \frac{2 - 4z}{-2}$$

$$y = -1 + 2z$$

$$2z + 2(-1 + 2z) = 4$$

$$2z + -2 + 4z = 4$$

$$6z = 6$$

$$z = 1$$

$$6z + 12 = -4$$

6+

$$0 + 10 + 9 = 5$$

6+

$$-3 - 16 + 15$$

$$0.5$$

$$-1.12$$

$$\frac{0.5}{-8-0} = \frac{-3}{8}$$

2

5

5

$$(0, 5)$$

$$0.5$$

$$\begin{pmatrix} 10 & 10 \\ 8 & 2 \\ 11 & 0 \end{pmatrix}$$

$$\frac{10-5}{10-0} = \frac{5}{10} = \frac{5}{10}$$

$$x - 2y - 3z = 5$$

$$x + 2y + 3z = 7$$

$$x + z = 3$$

$$x = 3 - z$$

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

$$(3-z) + 2y + 3z = 7$$

$$-3z - 2 - 2y = 5 - 3$$

$$3z - 2 + 2y = 7 - 3$$

$$-4z - 2y = 2$$

$$8z + 2y = 4$$

$$\frac{-2y}{-2} = \frac{2-4z}{-2}$$

$$y = -1 + 2z$$

$$2z + 2(-1 + 2z) = 4$$

$$2z + -2 + 4z = 4$$

$$6z = 6$$

$$z = 1$$

$$1 - \frac{1}{5} + \frac{1}{15} = \frac{3+1-1}{15} = \frac{3}{15} = \frac{1}{5}$$

$$\frac{10}{15} = \frac{2}{3}$$

$$\frac{2x}{x^2-5}$$

$$3x=5$$

or

$$\frac{c}{c+1}$$

$$\frac{y(y+k)}{4x^2+y^2}$$

$$\frac{y}{4}$$

$$\frac{x+3}{x(x/3)}$$

$$\frac{x+3}{x}$$

$$y = -20x + 2$$

$$y = -20x - 4$$

$$1 = x/3$$

$$y = 2x + 1$$

$$y = 0.4x + 3$$