☐ ***Objective Set 1: Classifying Numbers as Real, Rational, Irrational, Integer, Whole or Natural***

Khan Academy Number Sets

Circle each set of numbers that each number belongs to. Circle ALL that apply.

a.) $\sqrt{25}$ — (Real) (Rational) Irrational (Integer) (Whole) (Natural)

b.) -3.14 — (Real) (Rational) Irrational Integer Whole Natural

☐ ***Objective Set 2: Computing basic number operations (add, subtract, multiply, divide – with FRACTIONS!)***

Khan Academy Order of Operations

Simplify each of the expressions below.

a.) $\frac{3}{4}-\frac{7}{9}+2$

LCD = 36

$\frac{27}{36}-\frac{28}{36}+\frac{72}{36}=\boxed{\frac{71}{36}}$

b.) $\frac{3}{7}\div\frac{4}{14}$

$\frac{3}{1}\cdot\frac{14^{2}}{4_{2}}=\boxed{\frac{3}{2}}$

c.) $-92+(-19)+82$

$\boxed{-29}$

d.) $\left(\frac{-1}{5}\right)^{2}=\boxed{\frac{1}{25}}$

e.) $\frac{3-9}{3+7}$

$\frac{-6}{10}=\boxed{-\frac{3}{5}}$

f.) $7(2)-(3+5)^{2}\div 4-2$

$14-8^{2}\div 4-2$

$14-64\div 4-2$

$14-16-2$

$-2-2$

$\boxed{-4}$

☐ ***Objective Set 3: Simplifying expressions.***

Khan Academy Distributive Property

Khan Academy Multiplying Polynomials

Khan Academy Exponent Products

Khan Academy Exponent Quotients

Khan Academy Exponent Properties Part 3

Simplify each of the expressions below.

a.) $3(x-4x^2)+3x-4(2x+1)$

$3x - 12x^2 + 3x - 8x - 4$

$-12x^2 - 2x - 4$

b.) $7-2(4ab-3a)+7(2b-4ab)$

$7 - 8ab + 6a + 14b - 28ab$

$-36ab + 6a + 14b + 7$

c.) $(3m-4b)^2$

$(3m-4b)(3m-4b)$

$9m^2 - 24mb + 16b^2$

d.) $-2(3x+4y-8xy)$

$-6x - 8y + 16xy$

e.) $(2x-5)(3x^2+4x-7)$

$6x^3 + 8x^2 - 14x$

$-15x^2 - 20x + 35$

$6x^3 - 7x^2 - 34x + 35$

f.) $\dfrac{3xy^2}{21x^4yz^{-4}}$

$\dfrac{1yz^4}{7x^3}$

g.) $\left(\dfrac{-14a^2bc^3}{2a^4b^2c}\right)\left(\dfrac{3a}{7c^3}\right)$

$\dfrac{-3}{abc}$

h.) $(3mx^2)^{-1}$

$\dfrac{1}{3mx^2}$

i.) $\left(\dfrac{-2x^2y^{-3}}{4x^3y^2}\right)^2$

$\left(\dfrac{-1}{2xy^5}\right)^2$

$\dfrac{1}{4x^2y^{10}}$

☐ ***Objective Set 4: Evaluate expressions.***

Khan Academy Evaluate Expressions

Evaluate each expression below for the given values.

a.) $(2x-3)^2-4x+7$ for x = -2

$4x^2-12x+9$

$-4x+7$

$4x^2-16x+16$

$4(-2)^2-16(-2)+16$

$16+32+16 = 64$

b.) $\left(\frac{3x^2}{-y}\right)+z$ for x = -1, y = 2, z = 5/3

$\left(\frac{3(-1)^2}{-2}\right)+\frac{5}{3}$

$\left(\frac{3\cdot 1}{-2}\right)+\frac{5}{3}$

$\left(\frac{-3}{2}\right)+\frac{5}{3}$

$\frac{-9}{6}+\frac{10}{6} = \frac{1}{6}$

c.) $|2-x|+8$ for x = 5

$|2-5|+8$

$|-3|+8$

$3+8 = 11$

☐ ***Objective Set 5: Solving equations and inequalities – then graphing the solution on a number line.***

Khan Academy Solving Linear Equations

Khan Academy Solving Linear Inequalities

Solve the following. Graph when indicated.

a.) $2x - 5 = 7$

$+5 \quad +5$

$2x = 12$

$x = 6$

b.) $\frac{9}{5}=\frac{a-1}{2}$

$18 = 5(a-1)$

$18 = 5a-5$

$23 = 5a$

$a = \frac{23}{5}$

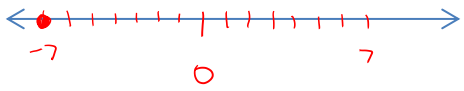
c.) $2(b-4)+8 = 3b+7$

$2b-8+8 = 3b+7$

$2b = 3b+7$

$-b = 7$

$b = -7$

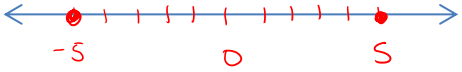


d.) $3|x| - 4 = 11$

$3|x| = 15$

$|x| = 5$

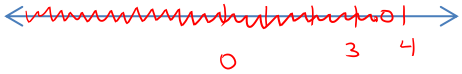
$x = 5, \quad x = -5$



e.) $3x - 4 < 7$

$3x < 11$

$x < \frac{11}{3}$



f.) $2(x - 4) + 3(4 - 5x) = 25 - 7(3 + 2x) + x$

$2x - 8 + 12 - 15x = 25 - 21 - 14x + x$

$-13x + 4 = -13x + 4$

all real numbers $\mathbb{R}$

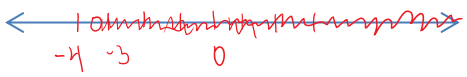
g.) $\frac{1}{2}(4x - 5) + 3 \geq -6$ $\quad)^2$

$4x - 5 + 6 \geq -12$

$4x + 1 \geq -12$

$4x \geq -13$

$x \geq -\frac{13}{4}$



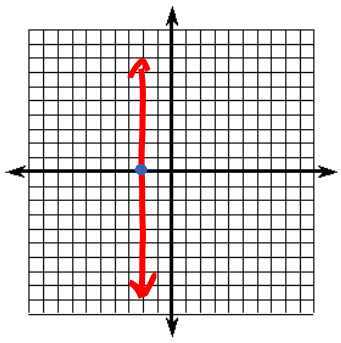
☐ ***Objective Set 6: Graphing equations of lines in standard form, slope-intercept form, point-slope form and horizontal/vertical form.***

Khan Academy Graphing a Line in Slope Intercept Form

Khan Academy Converting to Slope Intercept Form

Graph each line on the grid provided.

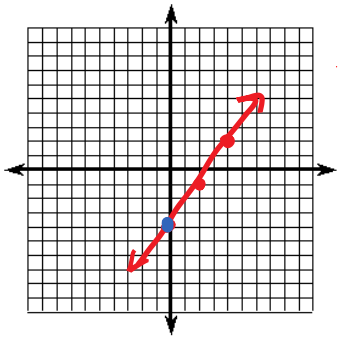
a.) $x = -2$



b.) $y = 3/2x - 4$

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

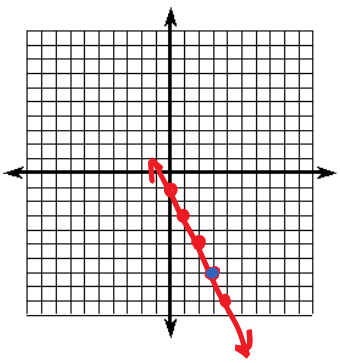
$b = (0, -4)$



c.) $y + 7 = -2(x - 3)$

$(3, -7)$

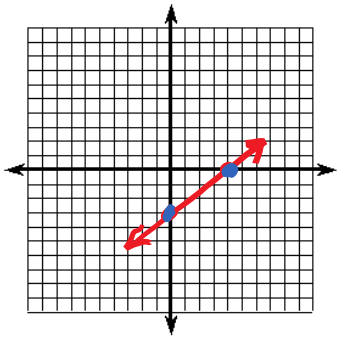
$m = -2$



d.) $3x - 4y = 12$

(4,0)

(0,-3)

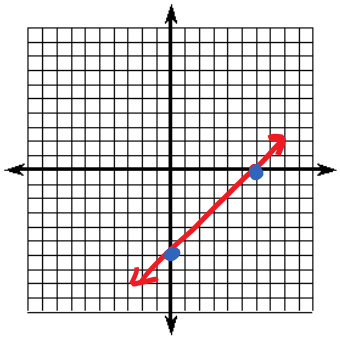


e.) $3(x - 4) = 3y + 6$

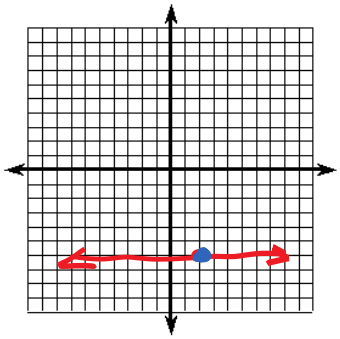
$3x - 12 = 3y + 6$

$3x - 3y = 18$

(6,0) (0,-6)



f.) parallel to the x-axis through (2,-6)



☐ ***Objective Set 7: Writing equations of lines in slope-intercept and point-slope form.***

Khan Academy Writing Equations of Lines

Write an equation of the line for the given information.

a.) goes through (2, 3) and (-4, 6)

$m = \frac{6-3}{-4-2}$

$m = \frac{3}{-6}$

$m = -\frac{1}{2}$

$y - 3 = -\frac{1}{2}(x-2)$

$y - 3 = -\frac{1}{2}x + 1$

$+3 \qquad +3$

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

b.) has a slope of -3/4 and y-intercept of 5

$y = -\frac{3}{4}x + 5$

c.) that models this relationship

Time(secs)	0	1	2	3
Distance(feet)	15	25	35	45

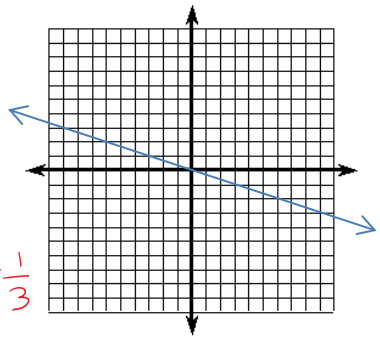
+1

$y = 10x + 15$

x = time

y = distance

d.)



$m = -\frac{1}{3}$

$b = (0,0)$

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

e.) Is perpendicular to y = 3/4x + 5 and goes through (-9, 6)

$\perp m = -\frac{4}{3}$

$y - 6 = -\frac{4}{3}(x + 9)$

$y - 6 = -\frac{4}{3}x - 12$

$+6 \quad +6$

$y = -\frac{4}{3}x - 6$

☐ ***Objective Sets 8 & 9: Recognizing whether a relation is a function and indicating its domain and range.***

Khan Academy Recognizing a Function and its Domain and Range

Indicate whether or not the relation is a function. If the relation is a function, identify the Domain and Range.

a.)

X	-2	-2	-2	-2
F(x)	3	5	7	9

no. -2 has more than 1 output

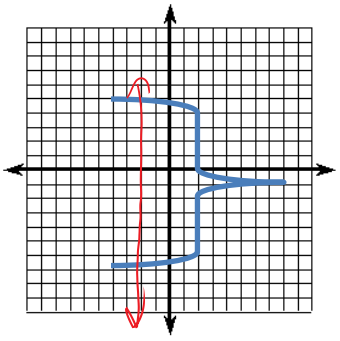
b.) (-2, 3) (3, 4) (4, 3) (5, 6)

yes, every input has 1 output

D: {-2, 3, 4, 5}

R: {3, 4, 6}

c.)



No- fails the vertical line test

d.) h(x) = 2|x|

yes. Every x has one y value

D: ℝ or

R: $y \geq 0$

☐ ***Objective Set 10: Factoring Polynomials using the Greatest Common Factor, Difference of Two Squares, Lead Coefficient of One OR a combination of two of these ☺***

Khan Academy GCF Factoring

Khan Academy Factoring Strategies

Factor each of the following completely.

a.) $3xy - 15x^2y^3$

$3xy(1 - 5xy^2)$

b.) $49x^2 - 25y^2$

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

c.) $x^2 - 6x - 55$

$(x - 11)(x + 5)$

d.) $a^4 + a^2 - 6$

$(a^2 + 3)(a^2 - 2)$

e.) $2y^2 + 30y + 112$

$2(y^2 + 15y + 56)$

$2(y + 7)(y + 8)$

f.) $a^4 - 81$

$(a^2 - 9)(a^2 + 9)$

$(a - 3)(a + 3)(a^2 + 9)$

g.) $3x^2 + 75$

$3(x^2 + 25)$

h.) $4a^4 - 16a^3 + 180a^2$

$4a^2(a^2 - 4a + 45)$

☐ ***Objective Set 11: Solving Right Triangles using right triangle trigonometry.***

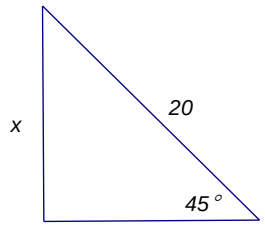
Khan Academy 45-45-90 Triangle Ratios

Khan Academy 30-60-90 Triangle Ratios

Khan Academy Triangle Trigonometry

Find the missing angle or side length using properties of right triangles.

a.)

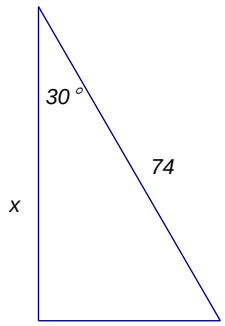


$\sin 45 = \frac{x}{20}$

$\frac{\sqrt{2}}{2} = \frac{x}{20}$

$x = 10\sqrt{2}$

b.)



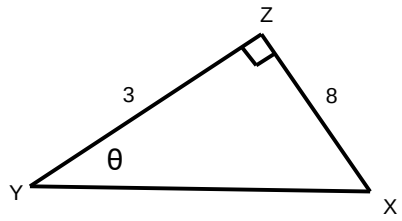
$\cos 30° = \frac{x}{74}$

$74 \cos 30° = x$

$74 \cdot \frac{\sqrt{3}}{2} = x$

$37\sqrt{3} = x$

c.)



$\tan\theta = \frac{8}{3}$

$\theta = \tan^{-1}\left(\frac{8}{3}\right)$

This answer requires a calculator!

$\theta = 69.44°$