Objective ① 16/30 ___

Range Min $30-16=14$

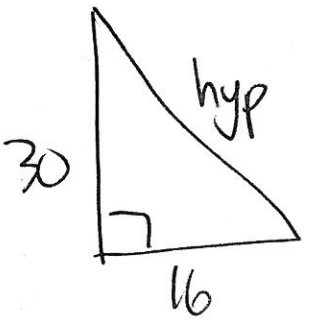
Range Max $30+16=46$

Range 14 to 46

third side $\in (14, 46)$

$14 < \text{third side} < 46$

Objective ② 16/30/ hyp



$hyp = \sqrt{30^2+16^2}$

$= \sqrt{900+256}$

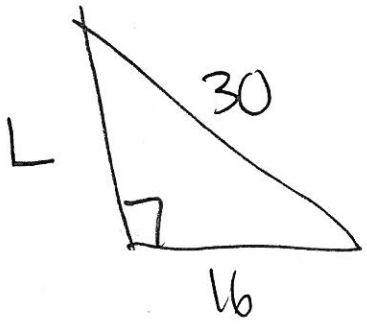
$= \sqrt{1156}$ exact

$hyp^2 = 1156 = 34^2 = 2^2 \cdot 17^2$

$hyp = \sqrt{1156} = (34)$

$= \sqrt{2^2 17^2} = 2 \cdot 17 = (34)$

Objective (3) leg / 16 / 30



$L = \sqrt{30^2 - 16^2}$

$= \sqrt{900 - 256}$ ← exact

$= \sqrt{644}$

$L = \sqrt{644} = \sqrt{4}\sqrt{161} = 2\sqrt{161}$

$= \sqrt{2^2 \cdot 7 \cdot 23} = \sqrt{2^2}\sqrt{7 \cdot 23} = 2\sqrt{161}$ ← simplified

$L \approx 25.3772$ ← approx

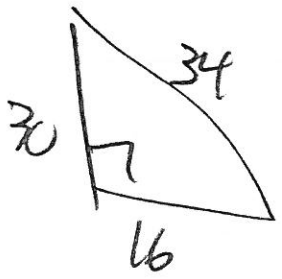
Range Revisited

14	$\sqrt{644}$	$\sqrt{1156}$	46
14	$2\sqrt{161}$	34	46
14	25.3772	34	46
↑ not a triangle	↑ right triangle	↑ right triangle	↑ not a triangle

Objective (4)

16/30/31 $34 \in (14, 46)$

hyp = 34 when



Since $31^2 < 34^2$

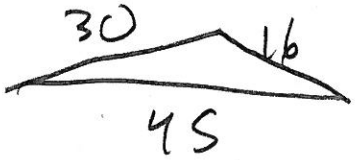
$31 < 34$ largest side < hyp

acute scalene

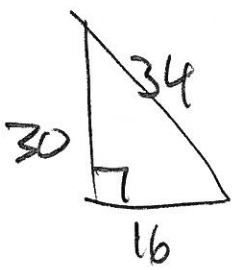
16/30/46 $46 \notin (14, 46)$

Not a triangle $16 + 30 = 46$

16/30/45



hyp = 34 when



Since $45^2 > 34^2$ largest side > hyp

$45 > 34$

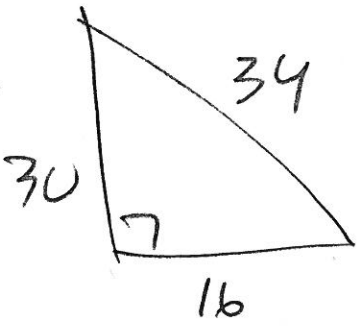
obtuse scalene

Objective (4)

$37 \in (14, 46)$
it is a triangle

16/30/37

Since hyp = 34 when



$37^2 > 34^2$

So thirdside > hyp

$37 > 34$

obtuse scalene

20/21/ ___

Objective ① Range

min $21-20=1$

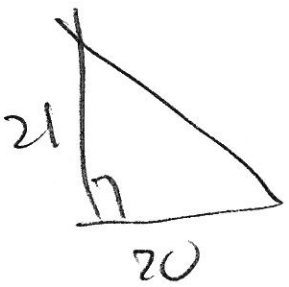
max $21+20=41$

1 to 41 Range

third side $\in (1,41)$

$1 < \text{third side} < 41$

Objective ② leg / leg / ___ → 20 / 21 / hyp



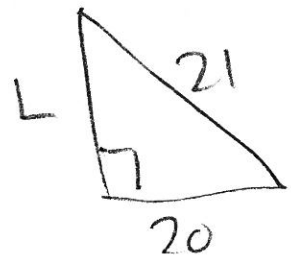
$hyp = \sqrt{21^2+20^2} = \sqrt{441+400} = \sqrt{841}$ exact

$= 29$

$841 = 29^2$

$\boxed{hyp = 29}$ simplified

Objective ③ ___ / leg / hyp → leg / 20 / 21

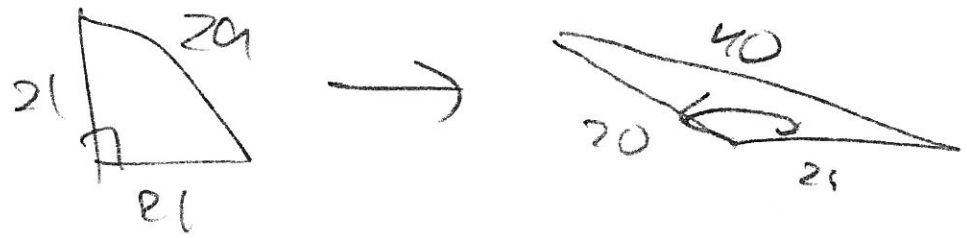


$L = \sqrt{21^2-20^2} = \sqrt{441-400} = \sqrt{41}$ exact

$L \approx 6.4031$ approximate

Objective (4)

Since hyp = 29 Range 14 to 41



+third side > hyp

obtuse scalene

Objective ⑥

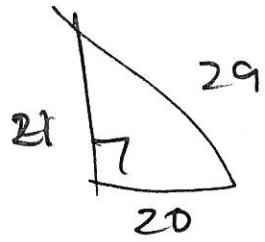
Recall Range 1 to 41

1	$\sqrt{41}$	$\sqrt{841}$	41
1	$\sqrt{41}$	29	41
1	6.4031 right	29 right	41 not a triangle

not a triangle

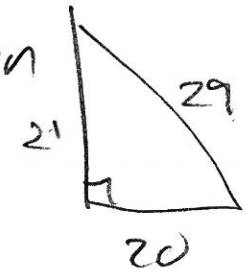
---

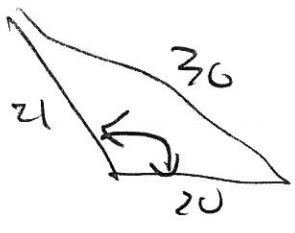
hyp = 29 when



20/21/29 Pythagorean triple (right scalene)

Since hyp = 29 when





third side > hyp

obtuse scalene

11/61 (this was toughest version)

Objective ①

Range $\quad min = 61 - 11 = 50$

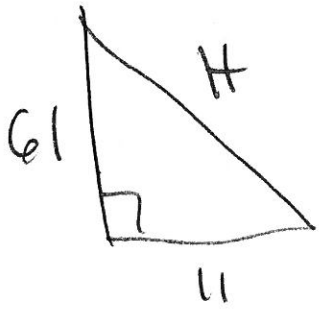
$\quad max = 61 + 11 = 72$

50 to 72

third side $\in (50, 72)$

$50 < \text{third side} < 72$

Objective ② Leg / Leg / __ → 11 / 61 / __

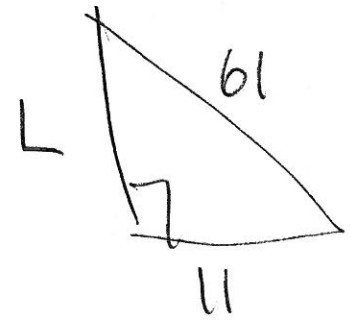


$H = \sqrt{61^2 + 11^2} = \sqrt{3721 + 121}$

$H = \sqrt{3842} \approx 61.9839$

$H^2 = 3842 = 2 \cdot 17 \cdot 113$

objective ③ __ / leg / hyp → __ / 11 / 61



$L = \sqrt{61^2 - 11^2} = \sqrt{3721 - 121}$

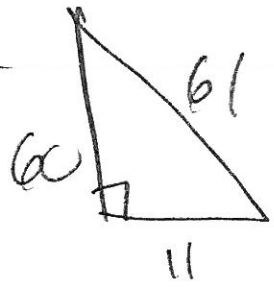
$L = \sqrt{3600} = 60$

$3600 = 100 \cdot 36 = 2^2 \cdot 5^2 \cdot 2^2 \cdot 3^2$ $\quad = 6$

$= 2^4 \cdot 3^2 \cdot 5^2$ $\quad \sqrt{\quad} = 2^2 \cdot 3 \cdot 5$

Objective (4) Tricky

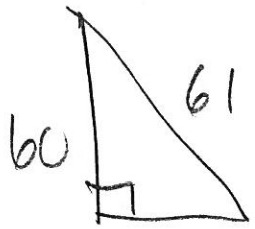
11/60/61

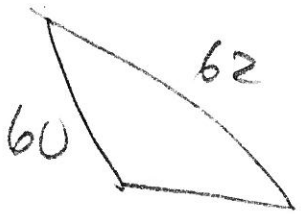
Since 

→ hyp = 61

right scalene

11/60/62





Since hyp < third side & $62 \in (50, 72)$

$61 < 62$

we know 11/60/62 is obtuse scalene

11/60/58 → 11/58/60 $\quad hyp = \sqrt{58^2 + 11^2}$

$= \sqrt{3485}$

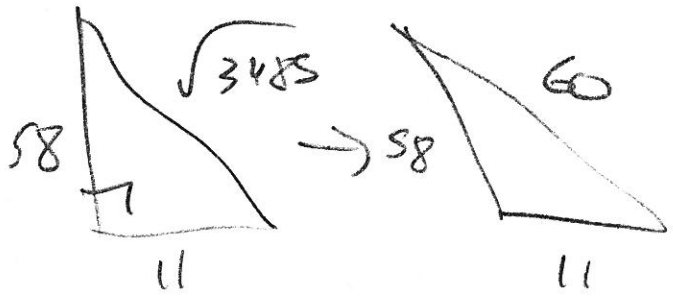
≈ 59.0339

Since thirdside = 60

hyp ≈ 59.0339

hyp < thirdside

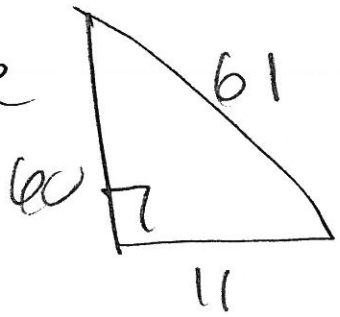
59.0339 < 60



obtuse scalene

Objective 4

11/60/63

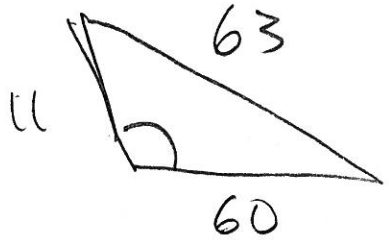


Since hyp < third side

61 < 61

& $63 \in (50, 72)$

obtuse scalene



21/28 Version

Objective ①

Range min = 28 − 21 = 7

max = 21 + 28 = 49

Range 7 to 49

third side $\in (7, 49)$

$7 < \text{third side} < 49$

Objective ② leg / leg / ___ → 21/28/hyp

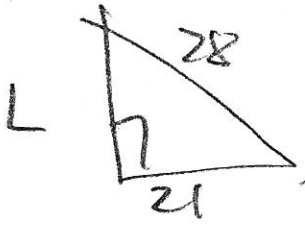
$hyp = \sqrt{21^2 + 28^2} = \sqrt{441 + 784}$

$hyp = \sqrt{1225} = 35$

exact simplified

Note $1225 = 5^2 \cdot 7^2$ $\sqrt{1225} = 5 \cdot 7 = 35$

Objective ③ _ / leg / hyp → leg / 21 / 28



$L = \sqrt{28^2 - 21^2} = \sqrt{784 - 441} = \sqrt{343}$

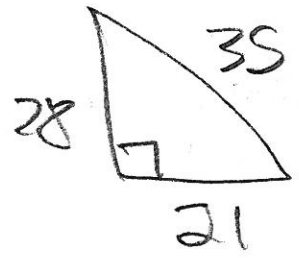
$L = \sqrt{49 \cdot 7} = \sqrt{49}\sqrt{7} = 7\sqrt{7}$

$L = \sqrt{343} = 7\sqrt{7} \approx 18.5203$

Objective (4) 21/28/47

Range 7 to 50 $47 \in (7, 49)$

Recall



hyp < third side

35 < 47

obtuse scalene

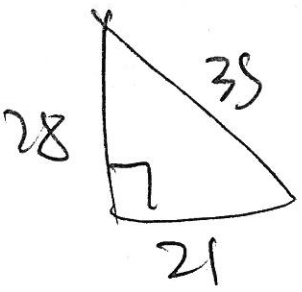
21/28/50

Range 7 to 49 ← cannot be 50

↗ cannot be ≤ 7

50 21/28/50 Not a triangle

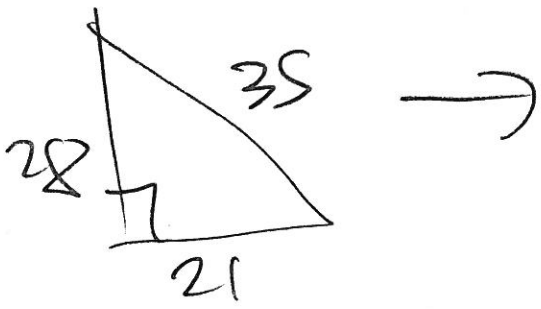
21/28/35



this is right scalene triangle

Objective (4)

21 | 28 | 32



→

hyp > third side

35 > 32

acute scale-e

Name_____

2nd hour	3rd hour	4th hour
5th hour	6th hour	7th hour

Table 1	Table 3	Table 5	Table 7
Table 2	Table 4	Table 6	Table 8

Standard Form Line Objective 1
I understand which form of the line is called the standard form of the line
I can explain it to others Not Yet

Standard Form Line Objective 2
I understand what A, B, and C are when given the standard form of the line
I can explain it to others Not Yet

Standard Form Line Objective 3
I understand the difference between lines that have AB > 0 and lines that have AB < 0
I can explain it to others Not Yet

Line Objective 1
I can plot intercepts correctly (when given Standard Form Lines)
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Line Objective 3
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Line Objective 4
I can isolate y correctly (when given Standard Form Lines)
I can explain it to others Not Yet

Technology Objective 1
I can plot a standard form line on a graphing calculator
I can explain it to others Not Yet

Technology Objective 2
I can plot a slope intercept form line on a graphing calculator
I can explain it to others Not Yet

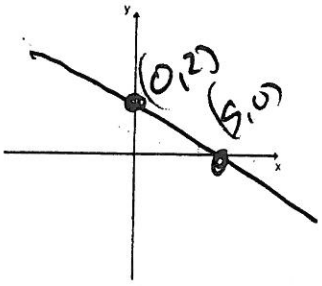
Technology Objective 3
I can plot a standard form line on the Desmos Graphing Application
I can explain it to others Not Yet

Technology Objective 4
I can plot a slope intercept form line on the Desmos Graphing Application
I can explain it to others Not Yet

Method 1: Intercept Method	Method 2: Divide by B method	Method 3: Solve for y method	Method 4: Graphing Technology
• X intercept is $\left(\frac{C}{A}, 0\right)$ • Y intercept is $\left(0, \frac{C}{B}\right)$ • Slope $m = \frac{-A}{B}$	• Divide all terms by B first • Apply the opposite of x term to both sides	• Move x term (this will CHANGE sign) • Isolate y (this means you will divide ALL terms by B)	• Plot line with technology • Find intercepts • Find slope from graph

Directions: 1) Sketch a graph of the standard form line. 2) complete the related table. 3) confirm 1 & 2 with technology.

Organizer Example 1
$2x+5y = 10$



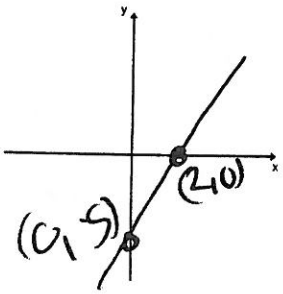
A	B	C	AB
2	5	10	10

Slope of the line
m = $-2/5$

X intercept as a point	Y intercept as a point
(5,0)	(0,2)

Y = mx+b form of line
$y = -\frac{2}{5}x + 2$

Organizer Example 2
$5x-2y = 10$



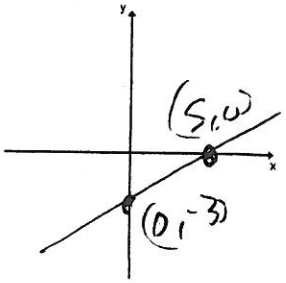
A	B	C	AB
5	-2	10	-10

Slope of the line
m = $5/2$

X intercept as a point	Y intercept as a point
(2,0)	(0,-5)

Y = mx+b form of line
$y = \frac{5}{2}x - 5$

Organizer Example 3
$-3x+5y = -15$



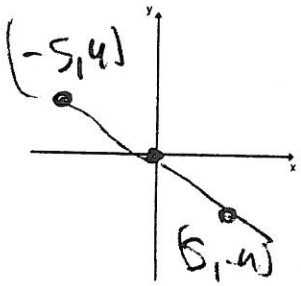
A	B	C	AB
-3	5	-15	-15

Slope of the line
m = $3/5$

X intercept as a point	Y intercept as a point
(5,0)	(0,-3)

Y = mx+b form of line
$y = \frac{3}{5}x - 3$

Organizer Example 4
$-4x-5y = 0$



A	B	C	AB
-4	-5	0	20

Slope of the line
m = $-4/5$

X intercept as a point	Y intercept as a point
(0,0)	(0,0)

Y = mx+b form of line
$y = -\frac{4}{5}x$

Complete these statements

- When AB is positive the slope is negative
- When AB is negative the slope is positive

Name_____

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5th hour	6th hour	7th hour

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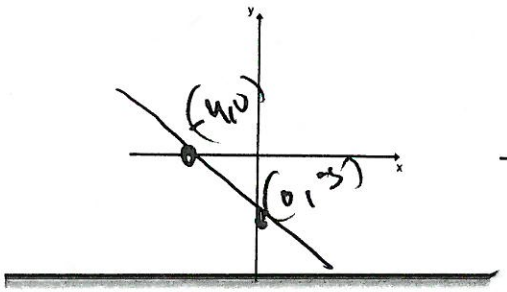
Directions: 1) Sketch a graph of the standard form line. 2) complete the related table. 3) confirm 1 & 2 with technology.

Understander Example 1
5x+4y = -20



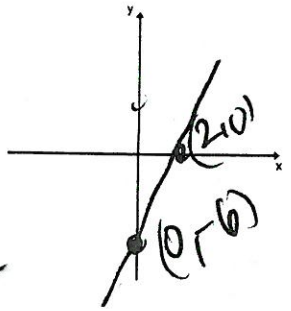
A	B	C	AB
5	4	-20	20

Slope of the line
m = -5/4

X intercept as a point	Y intercept as a point
(-4,0)	(0,-5)

Y = mx+b form of line
$y = -\frac{5}{4}x - 5$

Understander Example 2
6x-2y = 12



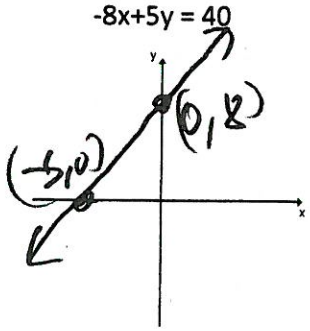
A	B	C	AB
6	-2	12	-12

Slope of the line
m = 6/2 3/1

X intercept as a point	Y intercept as a point
(2,0)	(0,-6)

Y = mx+b form of line
$y = \frac{6}{2}x - 6$
$y = 3x - 6$

Understander Example 3
-8x+5y = 40



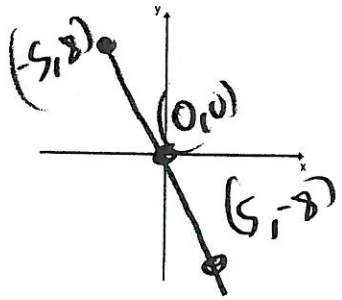
A	B	C	AB
-8	5	40	-40

Slope of the line
m = 8/5

X intercept as a point	Y intercept as a point
(-5,0)	(0,8)

Y = mx+b form of line
$y = \frac{8}{5}x + 8$

Understander Example 4
-8x-5y = 0



A	B	C	AB
-8	-5	0	40

Slope of the line
m = -8/5

X intercept as a point	Y intercept as a point
(0,0)	(0,0)

Y = mx+b form of line
$y = -\frac{8}{5}x$

Complete these statements

- When AB is positive the slope is negative
- When AB is negative the slope is positive

Name_____

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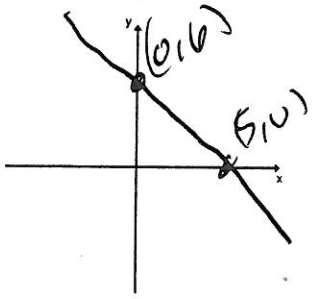
I can explain it to others Not Yet
Technology Objective 3
I can plot a standard form line on the Desmos Graphing Application
I can explain it to others Not Yet
Technology Objective 4
I can plot a slope intercept form line on the Desmos Graphing Application
I can explain it to others Not Yet

Method 1: Intercept Method	Method 2: Divide by B method	Method 3: Solve for y method	Method 4: Graphing Technology
• X intercept is $\left(\frac{C}{A}, 0\right)$ • Y intercept is $\left(0, \frac{C}{B}\right)$ • Slope m = $\frac{-A}{B}$	• Divide all terms by B first • Apply the opposite of x term to both sides	• Move x term (this will CHANGE sign) • Isolate y (this means you will divide ALL terms by B)	• Plot line with technology • Find intercepts • Find slope from graph

Directions: 1) Sketch a graph of the standard form line. 2) complete the related table. 3) confirm 1 & 2 with technology.

Resourcer Example 1
6x+5y = 30



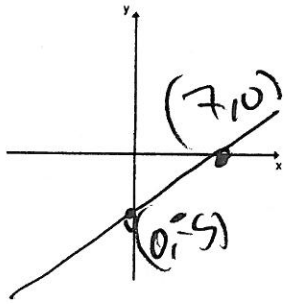
A	B	C	AB
6	5	30	30

Slope of the line
m = $-6/5$

X intercept as a point	Y intercept as a point
(5,0)	(0,6)

Y = mx+b form of line
$y = -\frac{6}{5}x + 5$

Resourcer Example 2
5x-7y = 35



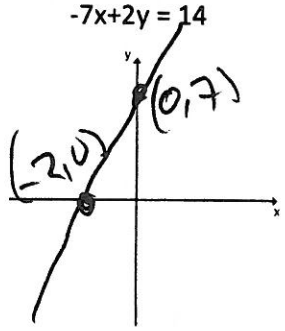
A	B	C	AB
5	-7	35	-35

Slope of the line
m = $5/7$

X intercept as a point	Y intercept as a point
(7,0)	(0,-5)

Y = mx+b form of line
$y = 5/7x - 5$

Resourcer Example 3
-7x+2y = 14



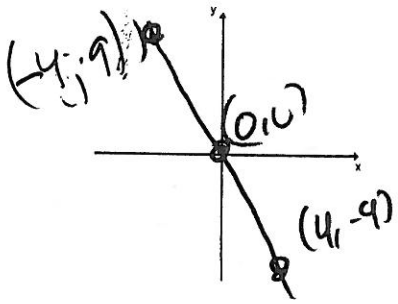
A	B	C	AB
-7	2	14	-14

Slope of the line
m = $7/2$

X intercept as a point	Y intercept as a point
(-2,0)	(0,7)

Y = mx+b form of line
$y = 7/2x + 7$

Resourcer Example 4
-9x-4y = 0



A	B	C	AB
-9	-4	0	36

Slope of the line
m = $-9/4$

X intercept as a point	Y intercept as a point
(0,0)	(0,0)

Y = mx+b form of line
$y = -9/4x$

Complete these statements

- When AB is positive the slope is negative
- When AB is negative the slope is positive

Name_____

2nd hour	3rd hour	4th hour
5th hour	6th hour	7th hour

Table 1	Table 3	Table 5	Table 7
Table 2	Table 4	Table 6	Table 8

Standard Form Line Objective 1
I understand which form of the line is called the standard form of the line
I can explain it to others Not Yet
Standard Form Line Objective 2
I understand what A, B, and C are when given the standard form of the line
I can explain it to others Not Yet
Standard Form Line Objective 3
I understand the difference between lines that have AB > 0 and lines that have AB < 0
I can explain it to others Not Yet

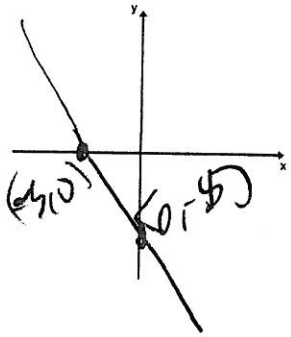
Line Objective 1
I can plot intercepts correctly (when given Standard Form Lines)
I can explain it to others Not Yet
Line Objective 2
I find intercepts correctly (when given Standard Form Lines)
I can explain it to others Not Yet
Line Objective 3
I find the slope correctly (when given Standard Form Lines)
I can explain it to others Not Yet
Line Objective 4
I can isolate y correctly (when given Standard Form Lines)
I can explain it to others Not Yet

Technology Objective 1
I can plot a standard form line on a graphing calculator
I can explain it to others Not Yet
Technology Objective 2
I can plot a slope intercept form line on a graphing calculator
I can explain it to others Not Yet
Technology Objective 3
I can plot a standard form line on the Desmos Graphing Application
I can explain it to others Not Yet
Technology Objective 4
I can plot a slope intercept form line on the Desmos Graphing Application
I can explain it to others Not Yet

Method 1: Intercept Method	Method 2: Divide by B method	Method 3: Solve for y method	Method 4: Graphing Technology
• X intercept is $\left(\frac{C}{A}, 0\right)$ • Y intercept is $\left(0, \frac{C}{B}\right)$ • Slope m = $\frac{-A}{B}$	• Divide all terms by B first • Apply the opposite of x term to both sides	• Move x term (this will CHANGE sign) • Isolate y (this means you will divide ALL terms by B)	• Plot line with technology • Find intercepts • Find slope from graph

Directions: 1) Sketch a graph of the standard form line. 2) complete the related table. 3) confirm 1 & 2 with technology.

Includer Example 1
8x+5y = -40



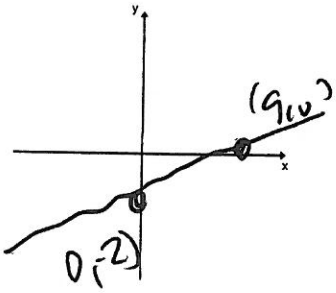
A	B	C	AB
8	5	-40	40

Slope of the line
m = $-8/5$

X intercept as a point	Y intercept as a point
(-5,0)	(0,-8)

Y = mx+b form of line
$y = -8/5x - 8$

Includer Example 2
2x-9y = 18



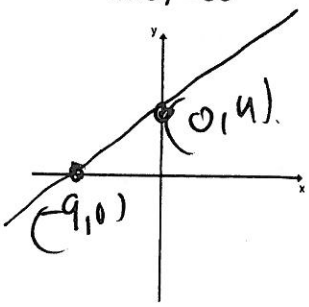
A	B	C	AB
2	-9	18	-18

Slope of the line
m = $2/9$

X intercept as a point	Y intercept as a point
(9,0)	(0,-2)

Y = mx+b form of line
$y = \frac{2}{9}x - 2$

Includer Example 3
-4x+9y = 36



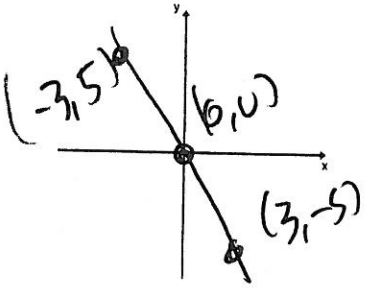
A	B	C	AB
-4	9	36	-36

Slope of the line
m = $4/9$

X intercept as a point	Y intercept as a point
(-9,0)	(0,4)

Y = mx+b form of line
$y = \frac{4}{9}x + 4$

Includer Example 4
-5x-3y = 0



A	B	C	AB
-5	-3	0	15

Slope of the line
m = $-5/3$

X intercept as a point	Y intercept as a point
(0,0)	(0,0)

Y = mx+b form of line
$y = -\frac{5}{3}x$

Complete these statements

- When AB is positive the slope is negative
- When AB is negative the slope is positive