More Moving Straight Ahead

Day	Topic	Homework	IXL	Grade
1	Graphing with a table and writing the equation	Ws 1	8.N.1	
2	Graphing with an equation	Ws 2	8.N.2	
3	Write equation given graph	Ws 3	8.N.3	
4	Practice	Ws 4/study for quiz	8.Y.4	
5	Quiz	Ws 5	8.Y.2	
6	Write equation given slope and point	Ws 6	8.Y.9	
7	Write equation give 2 points	Ws 7	8.Y.10	
8	Practice	Review packet		
9	Review	Study for Test		
10	Unit Test	None		

Important Concepts	Examples
Linear Relationships A relationship is linear if there is a constant rate of change between the two variables. That is, for each unit change in x, there is a constant change in y.	
Tables In the table, the **constant rate of change** can be observed as a pattern of consistent change in the variables.	For Gilberto's walking rate, as the time increases by 1 second, the distance increases by 2 meters. The constant rate of change is 2 meters per second. **Gilberto's Walking Rate** Time (seconds) / Distance (meters): 0 / 0; +2: 1 / 2; +4: 2 / 4; 3 / 6
Graphs If we graph the data, the constant rate of change between the two variables shows up as a straight line. This constant rate of change is called the **slope of the line**. It is the ratio of change between the two variables. For any two points on the line, $\text{slope} = \frac{\text{vertical change}}{\text{horizontal change}}$.	 Here, the slope is $\frac{4}{2}$ or $\frac{6}{3}$ or $\frac{2}{1}$.
Equations In the symbolic representation, the constant rate of change shows up as the **coefficient** of the independent variable.	Here, the coefficient of t is 2. Gilberto: $d = 2t$
***y*-intercept** On a graph, the y-intercept is the point at which the graph of a line crosses the y-axis (vertical axis).	 Suppose the cost to rent bikes is \$150 plus \$10 per bike. Symbolically, we can write $C = 150 + 10n$, where C is the cost in dollars and n is the number of bikes. The y-intercept is at (0, 150) because for 0 bikes, the cost is \$150. This means there is a fixed charge in addition to the cost per bike. The y-intercept is the constant term in the equation. The slope (or constant rate of change) of the line is 10, the coefficient of n.
Solving Equations To solve an equation, students write a series of equivalent equations until it is easy to read the value of the variable. Equivalent equations have the same solutions. Equality is maintained by adding, subtracting, multiplying, or dividing by the same quantity on each side of the equation. For multiplication and division, the quantity must not be zero. These procedures are called the **properties of equality**.	For the equation $C = 150 + 10n$, if C is 750, what is the value of n? **Equation** / **Reason** $750 = 150 + 10n$ — Original equation $750 - 150 = 150 - 150 + 10n$ — Subtract 150 from each side to undo adding 150. $600 = 10n$ — Simplify. $\frac{600}{10} = \frac{10n}{10}$ — Divide each side by 10 to undo multiplying by 10. $60 = n$ — Simplify. Note that if you replace n with 60 in each step, the equation is true. For example, the original equation simplifies to $750 = 750$.

Date: 9/11/18 Day 1

Linear Relationship

Graphing with a table and writing the equation

m = movement
b = beginning

Graph the information given in the table.

1)

x	0	1	2	3	4
y	1	3	5	7	9

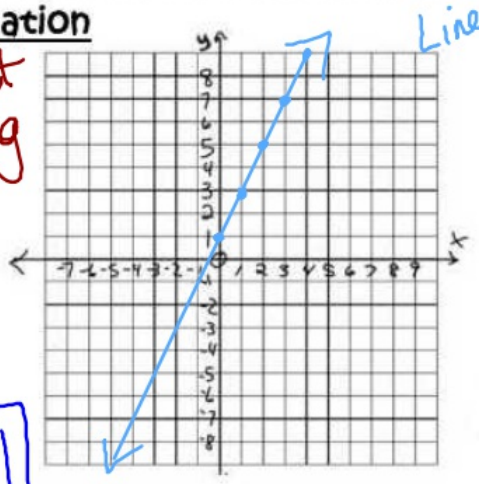
$y = mx + b$

Slope $= m = \frac{\Delta y}{\Delta x} = \frac{+2}{+1} = 2$

$y = 2x + 1$

y-intercept $= b = 1$

Starting amount y value when $x = 0$



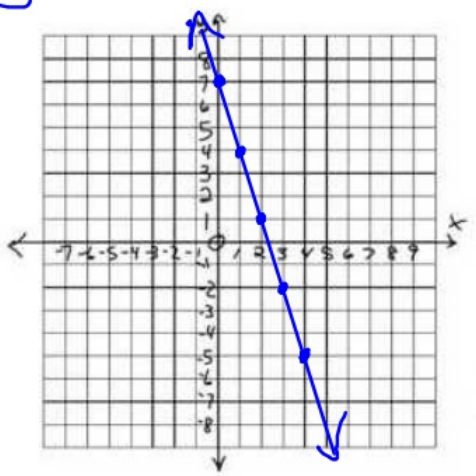
2)

x	0	1	2	3	4
y	7	4	1	-2	-5

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

$b = 7$

$y = -3x + 7$



3)

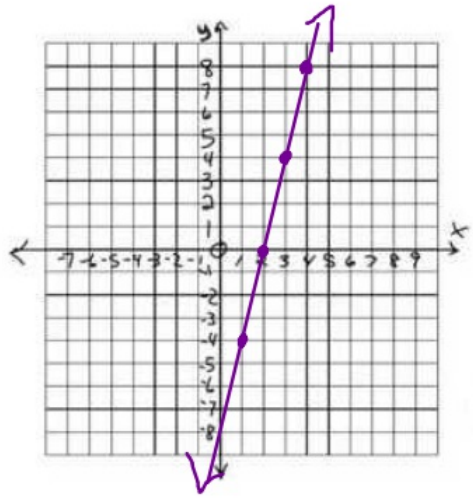
x	0	1	2	3	4	~~5~~
y	-8	-4	0	4	8	~~12~~

$m = \frac{\Delta y}{\Delta x} = \frac{+4}{+1} = 4$

$b = -8$

$y = 4x + -8$

$y = 4x - 8$

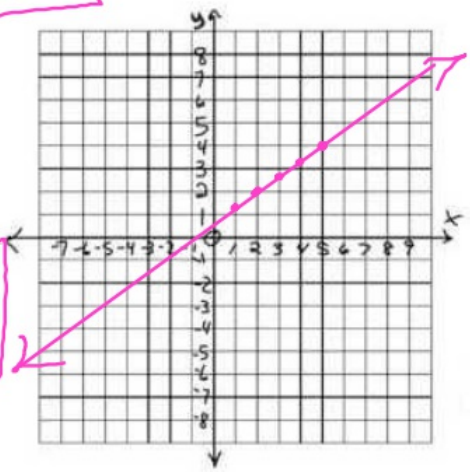


4)

x	0	1	2	3	4	5
y	$\frac{2}{3}$	$1\frac{1}{3}$	2	$2\frac{2}{3}$	$3\frac{1}{3}$	4

$m = \frac{\Delta y}{\Delta x} = \frac{+\frac{2}{3}}{+1} = \frac{2}{3}$ $b = \frac{2}{3}$

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



5) Identify the slope in each table.

6) Identify the y-intercept in each table.

7) Write the equation of the line for each table.

Use the table to write the equation of the line.

8) Equation: $y = \frac{1}{2}x$ $m = \frac{\Delta y}{\Delta x} = \frac{+1}{+2} = \frac{1}{2}$ $b = 0$

x	0	2	4	6	8	10
y	0	1	2	3	4	5

9) Equation: $m = \frac{\Delta y}{\Delta x} = -3$ b

x	1	2	3	4	5	6	7	8	9
y	13	10	7	4	1	-2	-5		-11

$\frac{-3}{+1} = -3$ $\frac{-3}{+1} = -3$ $\frac{-9}{+3} = -3$

10) Equation:

x	0	4	8	12	16
y	0	3	6	9	12

11) Equation:

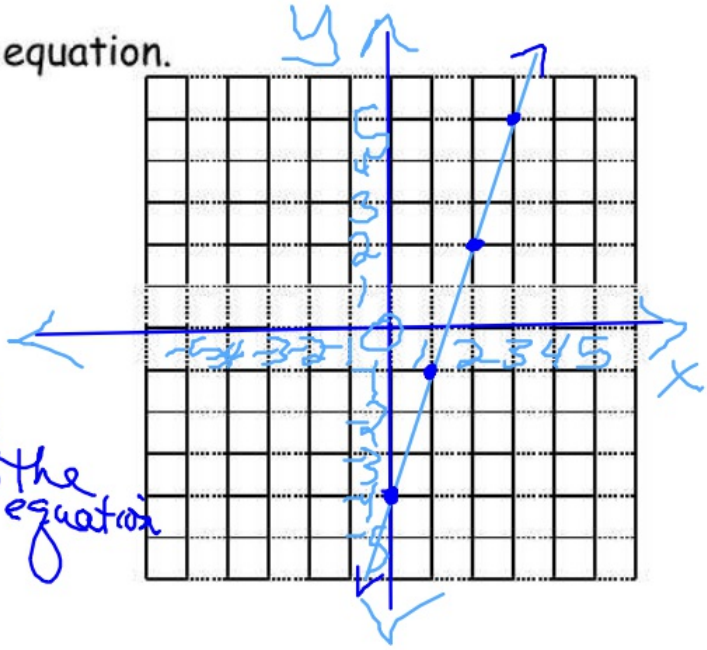
x	0	3	6	9	12
y	-13	-11	-9	-7	-5

Date: 9/12/18 Day 2 **Graphing from an Equation**

Given: y = 3x - 4

Create a table, then graph the equation.

x	0	1	2	3
y	-4	-1	2	5

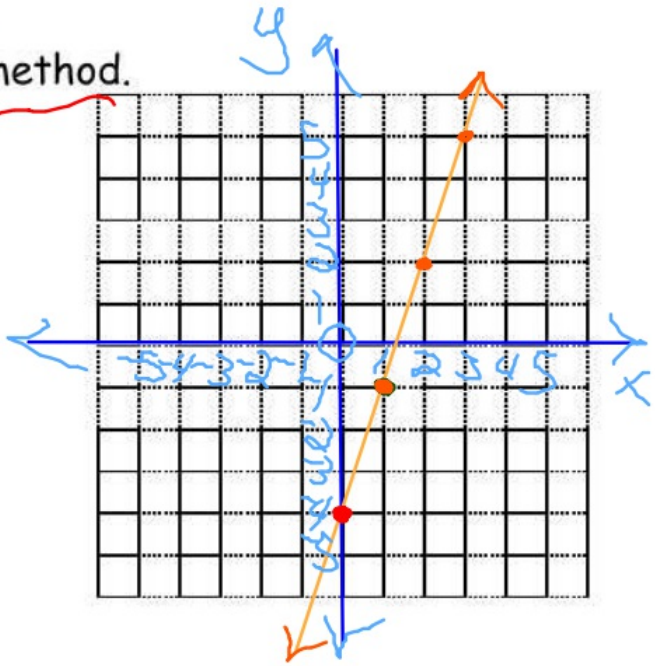


I pick x values. (0, 1, 2, 3)
Substitute the values into the equation

$y = 3(0) - 4 = -4$
$y = 3(1) - 4 = -1$
$y = 3(2) - 4 = 2$
$y = 3(3) - 4 = 5$

Given: y = 3x - 4

Graph using the slope-intercept method.



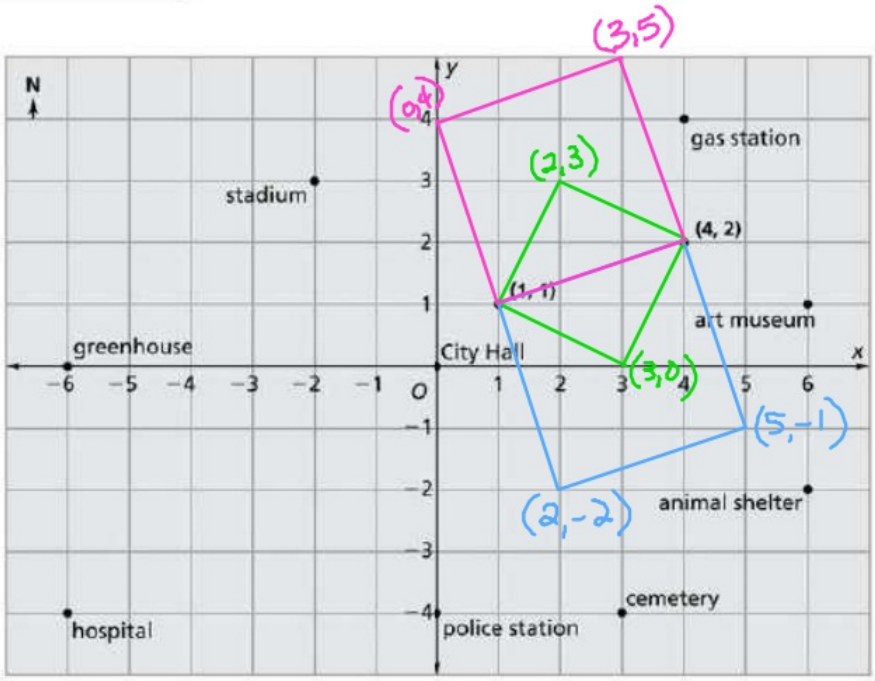
movement $m = 3 = \frac{3}{1}$ $\frac{\text{rise}}{\text{run}}$

beginning $b = -4$

$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{\text{rise}}{\text{run}}$

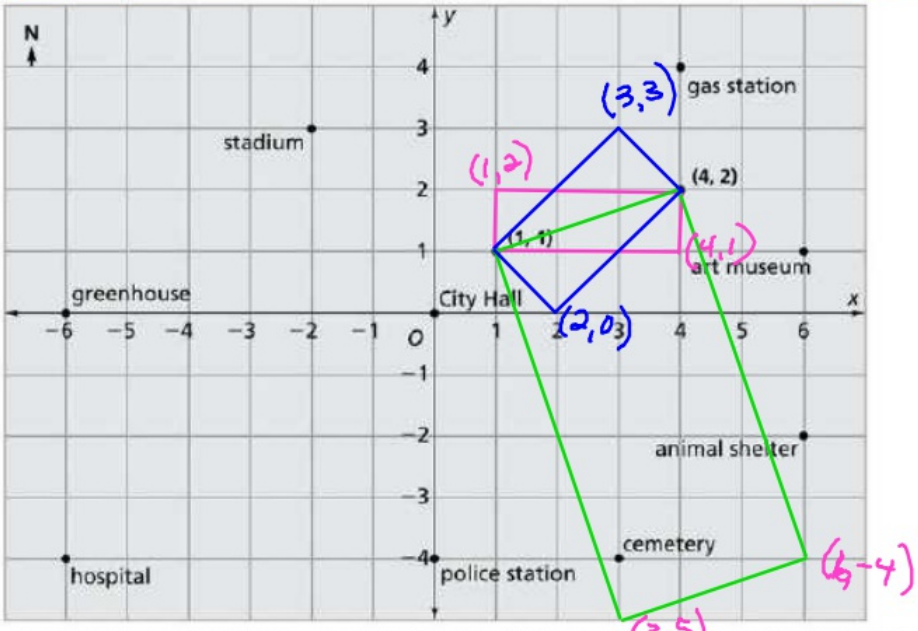
Labsheet 1.2 Planning Parks

A

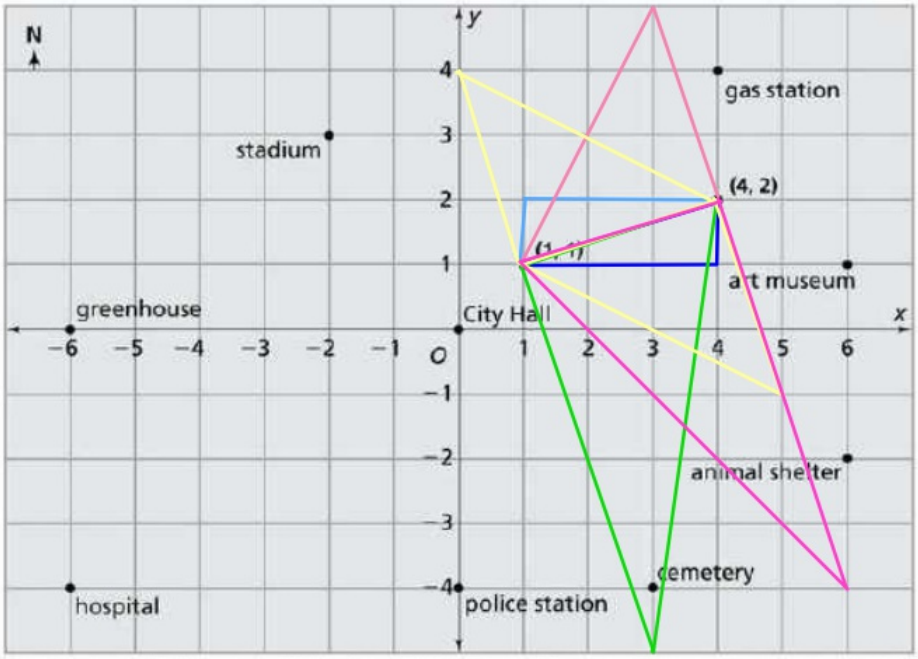


A) Suppose the park is to be a square. What could the coordinates of the other two vertices be? Give two answers.

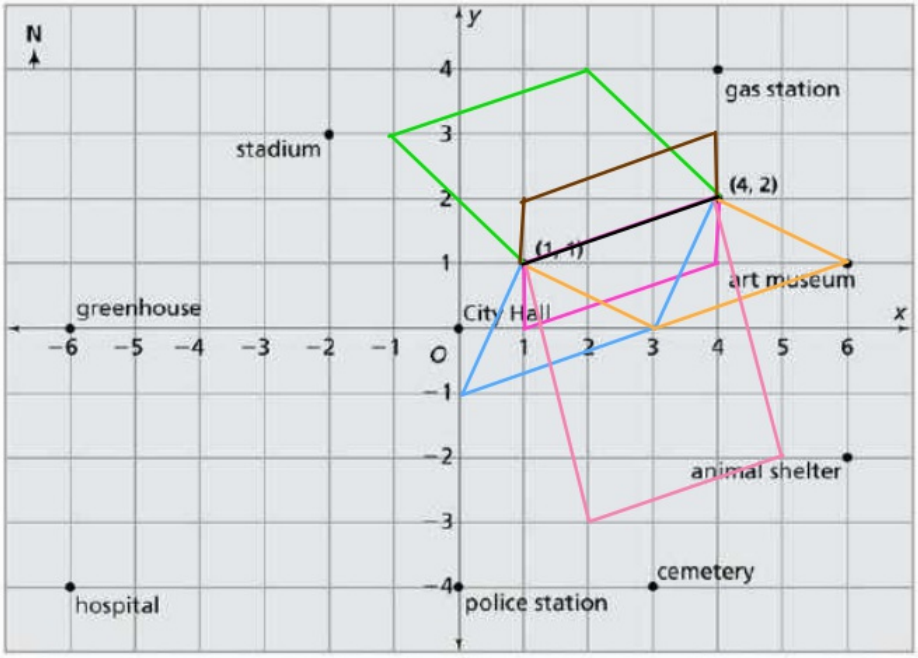
B



B) Suppose the park is a rectangle that is not a square. What could the coordinates of the other two vertices be? Give two answers.



C) Suppose the park is a right triangle. What could the coordinates of the other vertex be? Give two answers.

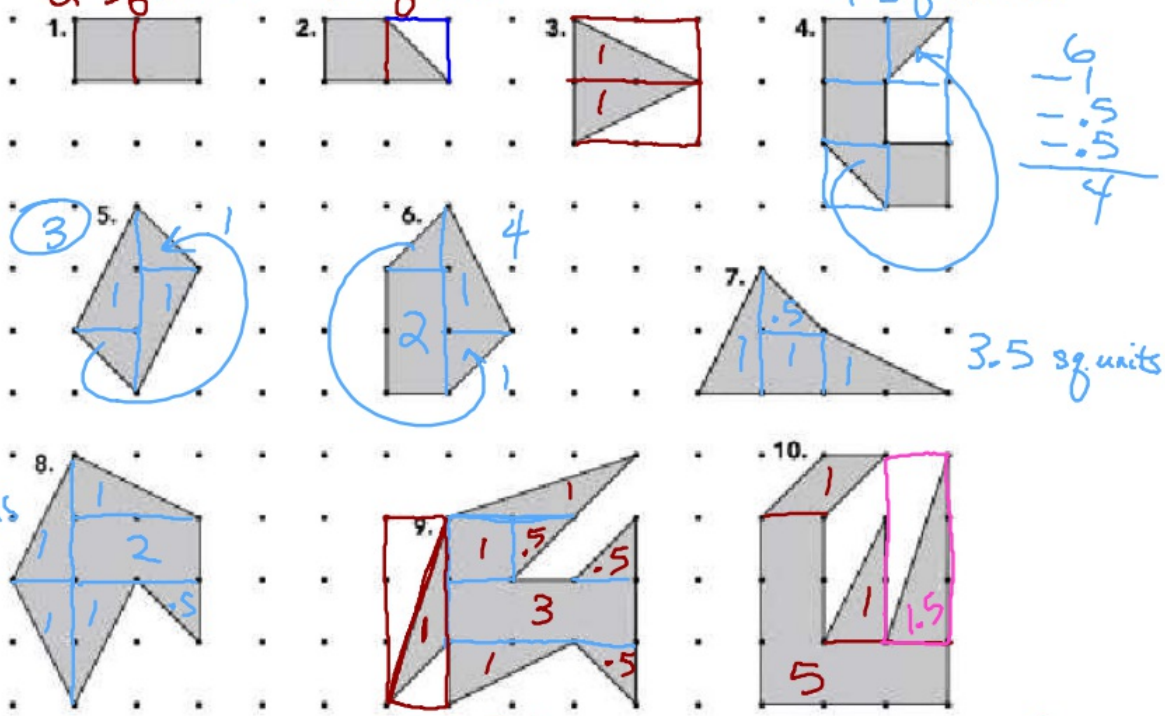


D) Suppose the park is a parallelogram that is not a rectangle. What could the coordinates of the other two vertices be? Give two answers.

Labsheet 1.3 Irregular Figures

$A = \frac{1}{2}bh$
$= \frac{1}{2}(2)(2)$
$= 2$

$A = lw$
$A = 2 \cdot 1$
$A = 2$



2 sq. units

1.5 sq. units

2 sq. units

4 sq. units

6
−1
−.5
−.5
4

3

4

3.5 sq. units

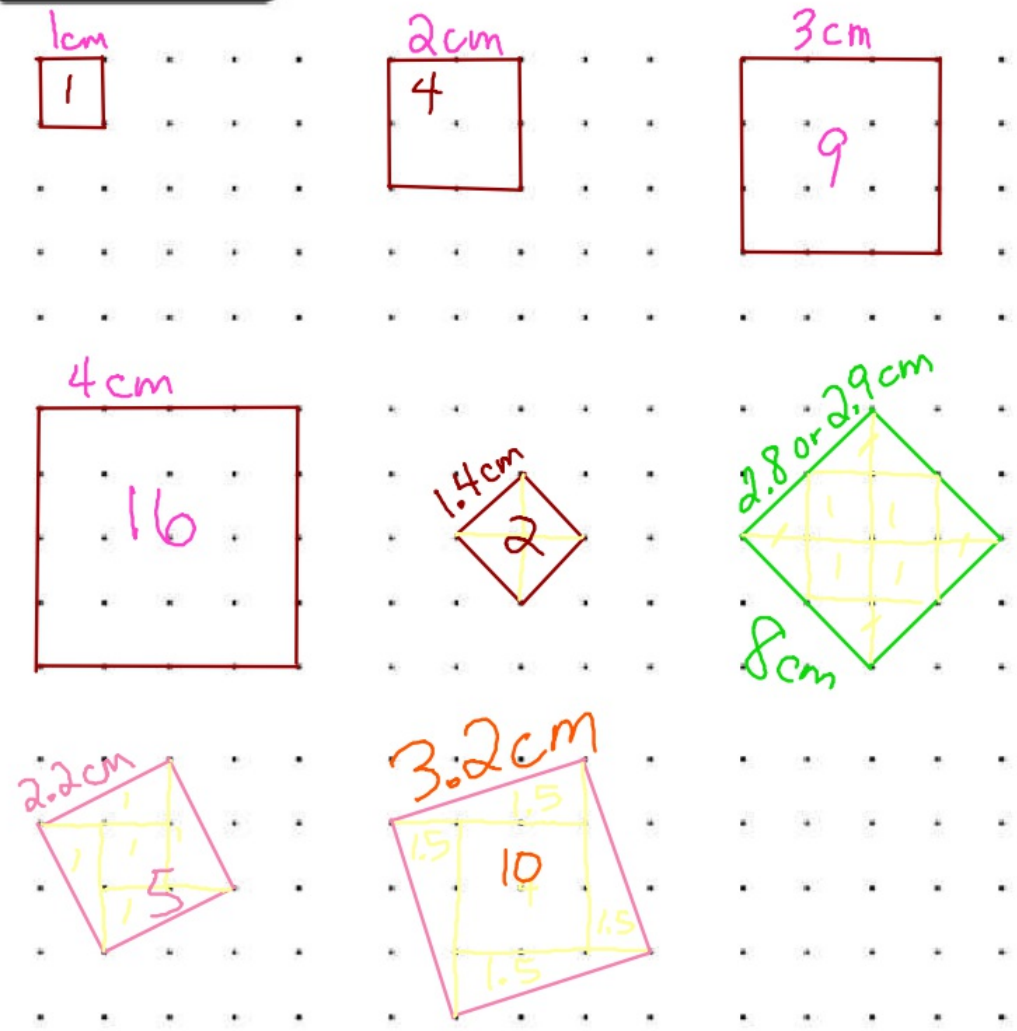
6.5 sq. units

8.5 sq. units

8.5 sq. units

3
−1.5
1.5
−.5
1

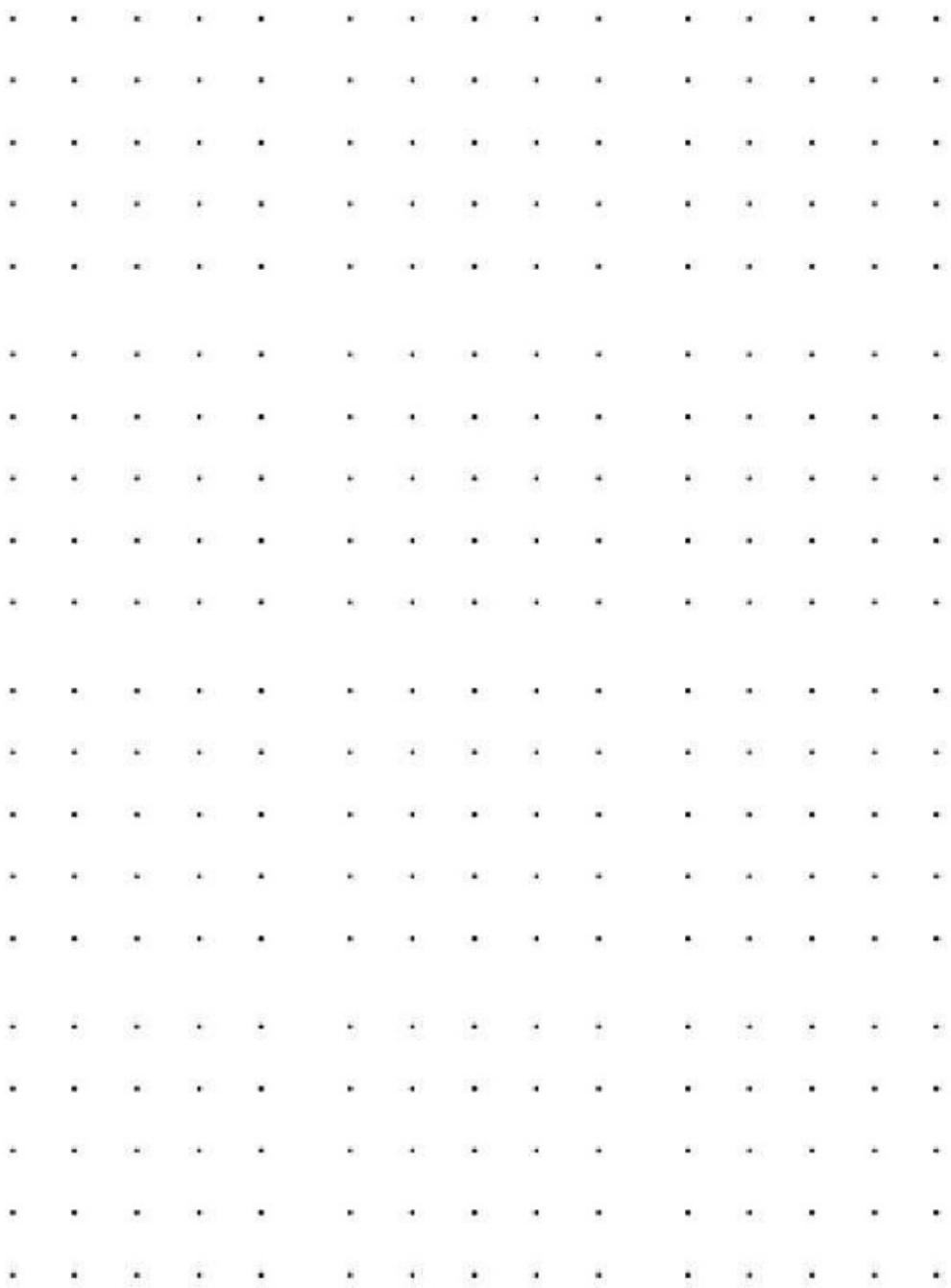
Labsheet 2.1 5 Dot-by–5 Dot Grids



1, 2, 4, 5, 6, 9, 10, 16

1, 1.4, 2, 2.2, 2.9, 3, 3.2, 4

Labsheet 2.1 5 Dot-by–5 Dot Grids



$\sqrt{}$ $\sqrt{64} = 8$ (area → 64, side length → 8) because $8 \cdot 8 = 64$

Labsheet 2.2 Square Roots

Area of a square: $A = s \cdot s$ or $A = s^2$

If you know the area of a square, you can work backwards to find the side length of the square by finding the square root $\sqrt{}$ of the area. $\sqrt{}$ Radical

If $A = s^2$ then s is the square root of A because $s \cdot s = A$

$\sqrt{4} = 2$ *and* $-\sqrt{4} = -2$. However, if asked to find the square root of 4, the answer is 2 and -2 because $2 \cdot 2 = 4$ and $-2 \cdot -2 = 4$.

Root	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Square	1	4	9	16	25	36	49	64	81	100	121	144	169	196	225

Side lengths / Areas

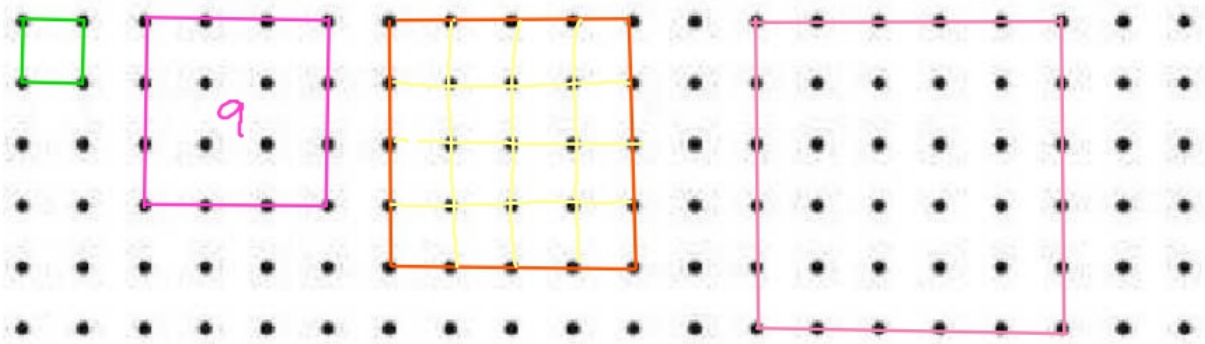
"Perfect"

ONLY USE YOUR CALCULATOR IF THE QUESTION TELLS YOU TO!!

196
169

A) 1) Find the side lengths of squares with areas of 1, 9, 16, and 25.

1: 1 9: 3 16: 4 25: 5



2) Use your calculator to find the following values:

$\sqrt{1} = 1$ $\sqrt{9} = 3$ $\sqrt{16} = 4$ $\sqrt{25} = 5$

B) 1) What is the area of a square with side lengths of 12 units? 144 sq. units 12^2

What is the area of a square with side lengths of 2.5 units? 6.25 sq. units

2.5^2

2) Find the missing numbers (use your calculator)

$\sqrt{144} = 12$ (144 = area, 12 = side) $\qquad \sqrt{6.25} = 2.5$

3) Find x.

a. $\sqrt{x^2} = \sqrt{121}$

$x = \pm 11$

$(-11)^2$

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

$(\sqrt{5})^2 = 5$

$(\sqrt{146})^2 = 146$

$\sqrt{(146)^2} = 146$

b. $\sqrt{x^2} = \sqrt{2.25}$

$x = \pm 1.5$

Check

If $x = 1.5$

$x^2 = 2.25$

$(1.5)^2 = 2.25$

$2.25 = 2.25$ ✓

If $x = -1.5$

$x^2 = 2.25$

$(-1.5)^2 = 2.25$

$2.25 = 2.25$ ✓

c. $(\sqrt{x})^2 = (121)^2$

$x = 14,641$

d. $\sqrt{2.25} = x$

$1.5 = x$

4)

C) 1) Measure the side of the square with an area of 2 with your ruler. 1.4 cm

2) Use your answer as a side length of a square to find the area. (square your answer from #1)

$A = 1.4^2 = 1.96$

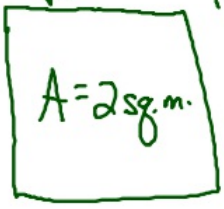
3) Use your calculator to find $\sqrt{2}$. 1.41421356...

Round it to the nearest tenth. 1.4

4) Compare your answers from # 1 and # 3.

They are the same.

5) $\sqrt{2}$ ← exact, 1.4142 ← approximate (estimate)



Study for Quiz

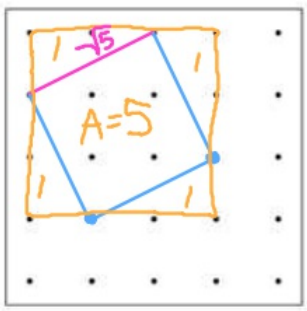
- Plot points
- State coordinates of points
- Find driving distances
- Give driving directions
- Draw square given 1 side
- Find areas of weird shapes.
- Use calculator to find $\sqrt{\ }$

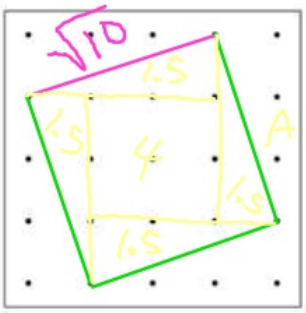
Between what 2 whole numbers does $\sqrt{5}$ lie?
2 and 3
because $\sqrt{5} \approx 2.23$

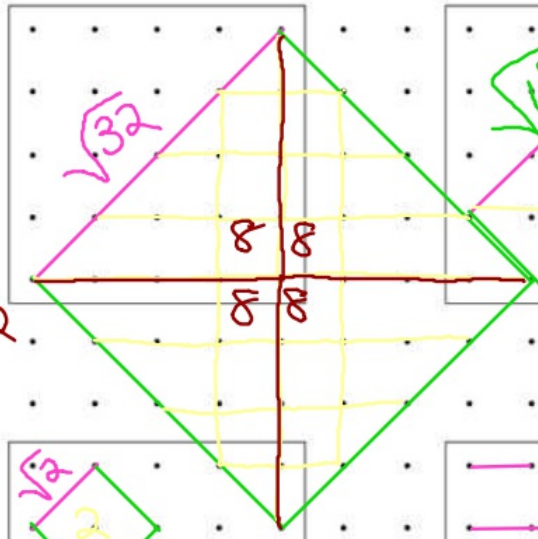
Labsheet 2.3 Figures on a Dot Grid

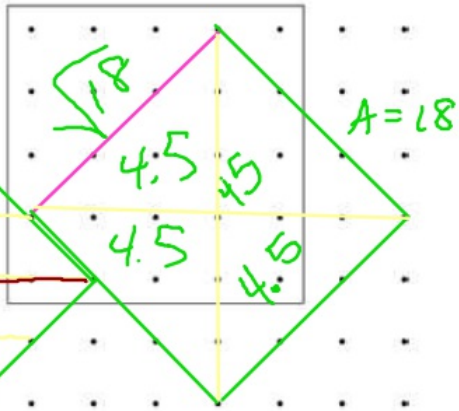
NIE 2 1

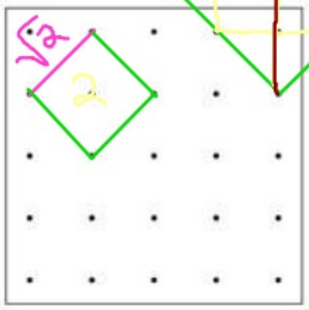
9 − 4 = 5

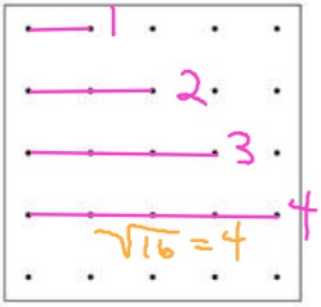




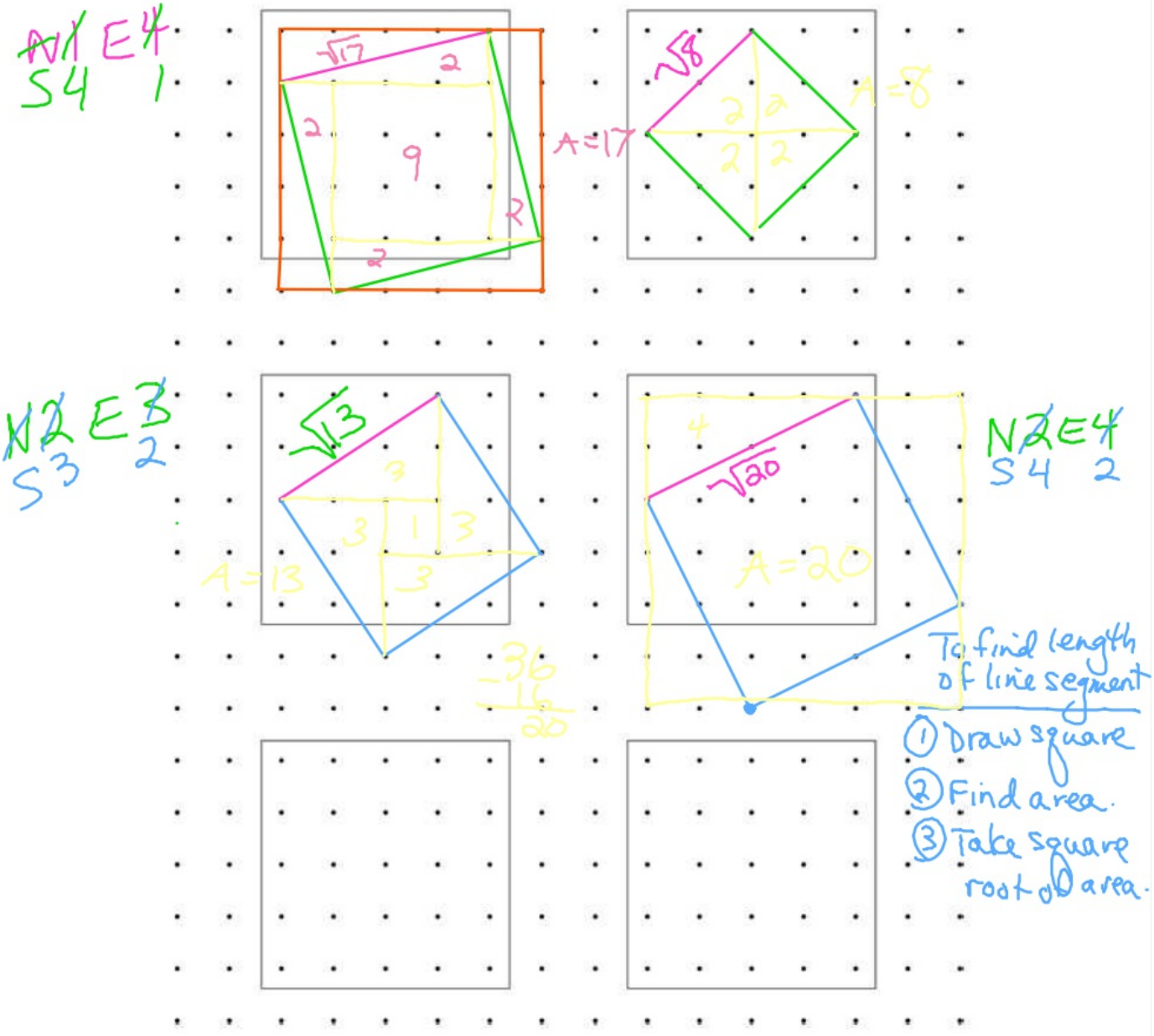








$25 - 8 = 17$


N1 E4
S4 1
√17
2
2
9
2
2
A=17
√8
2
2
2
2
A=8
N2 E3
S3 2
√13
3
3
1
3
3
A=13
N2 E4
S4 2
4
√20
A=20
-36
-16
20
To find length of line segment
① Draw square
② Find area.
③ Take square root of area.

$\sqrt{8} = 2.828427125$

$2\sqrt{2} = 2.828427125$

B)

1. Ella says the length of the segment in Figure 1 is $\sqrt{8}$ units. Oskar says it is $2\sqrt{2}$ units. Are both students correct? Explain.

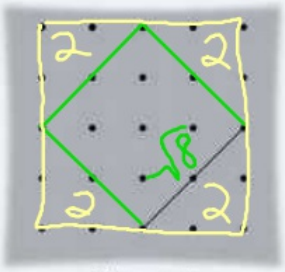


Figure 1

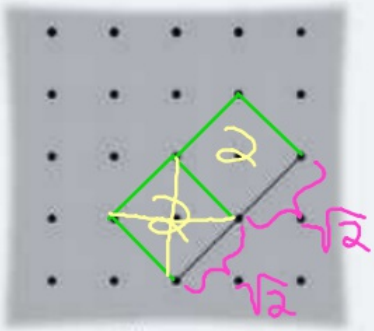


Figure 1

2. Express the exact length of the segr

3. Can you find a segment whose length cannot be expressed in two ways? Explain.

4. Which of the following lengths can be expressed in two ways: $\sqrt{5}$, $\sqrt{10}$, $\sqrt{18}$? Check your answers on a grid.