Unit 2: Graphing
Part 1: Points and Slope

SWBAT:

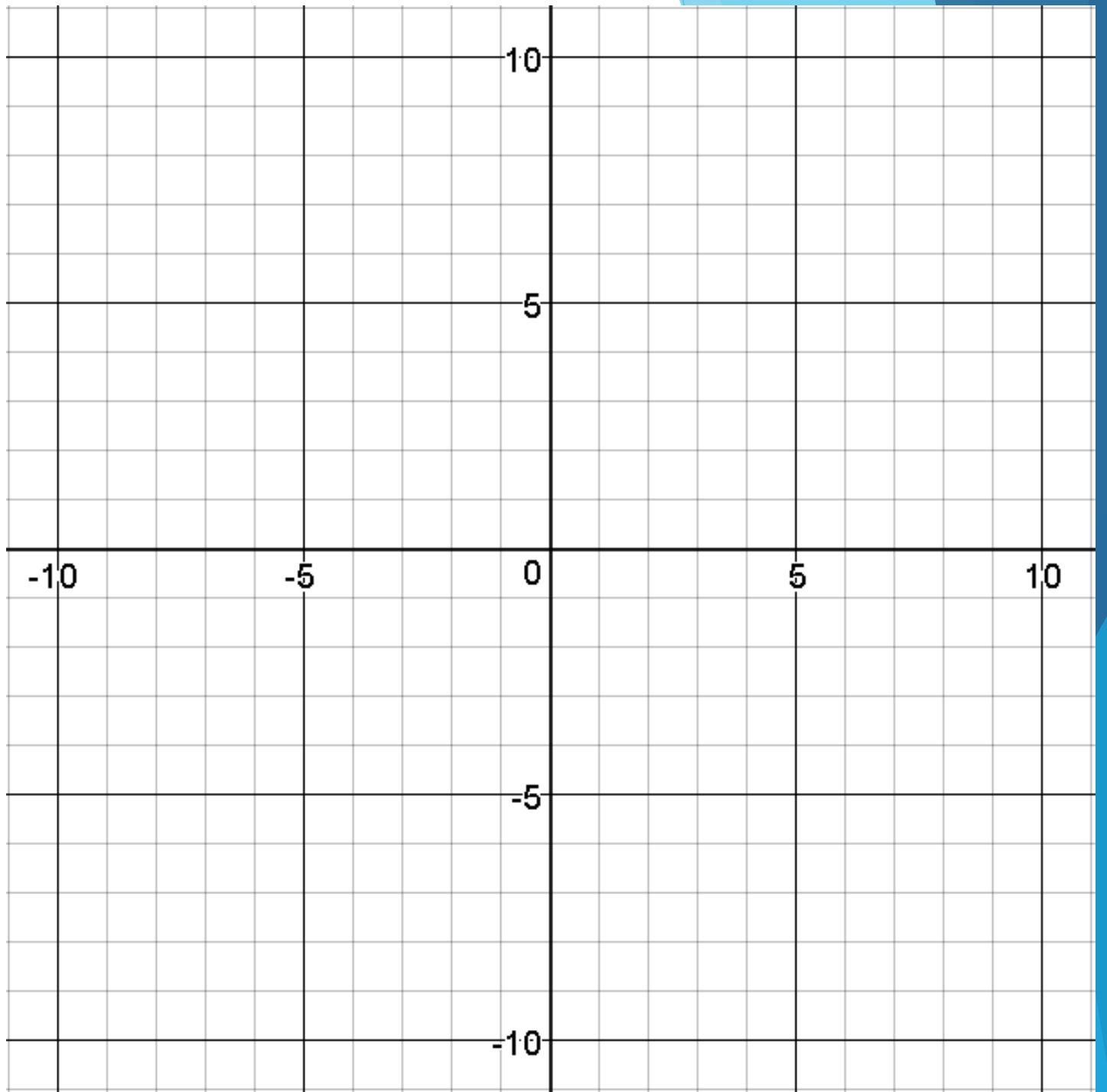
- plot points on a graph
- calculate the slope between two points

Assignments:

HW14

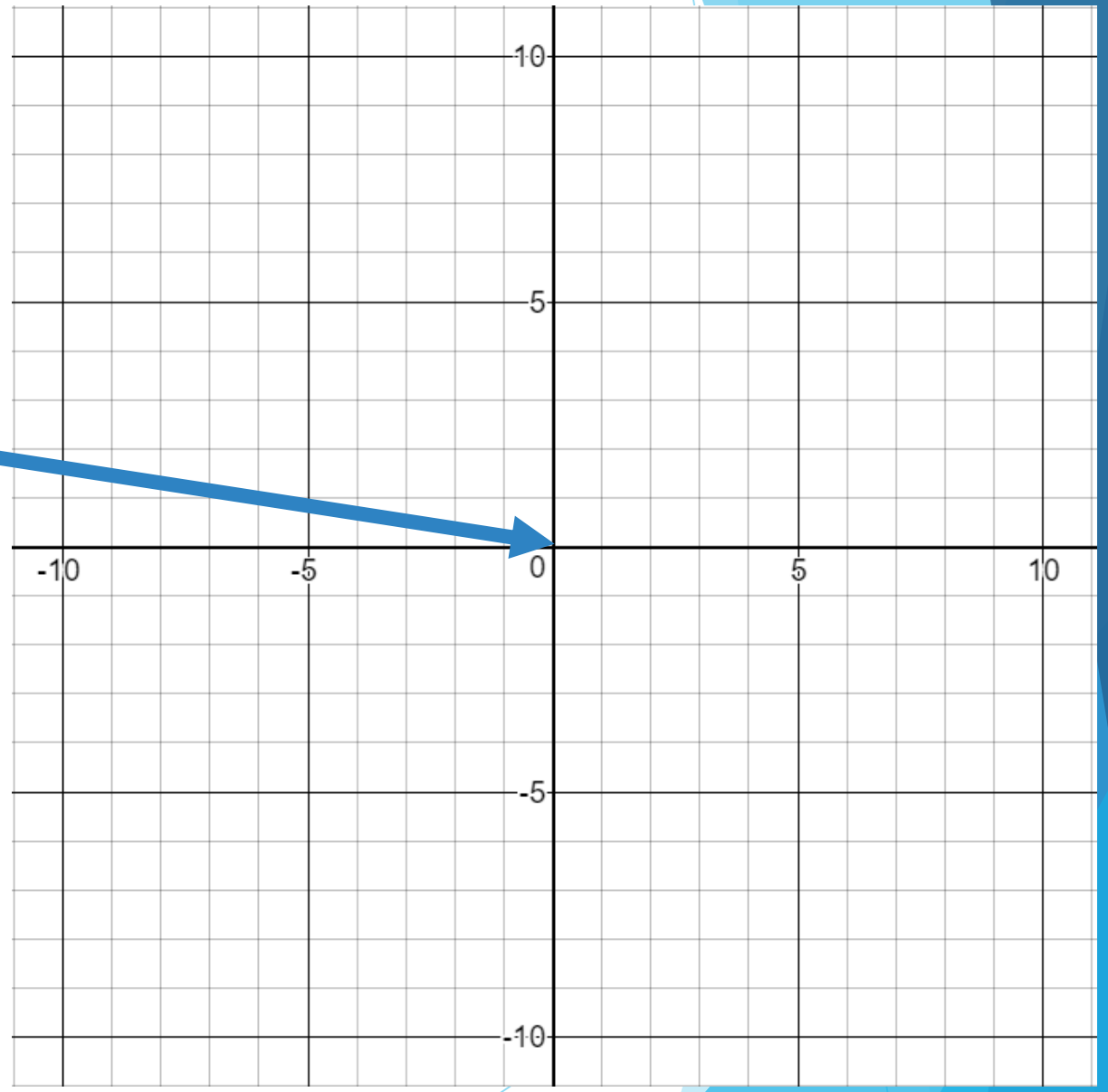
You will need graph paper today, and for all of unit 2!

- A **coordinate grid** is created from two number lines, or **axes**: one horizontal, one vertical
- The vertical number line is called *y*
- The horizontal number line is called *x*
- The **origin** is where the two axes meet



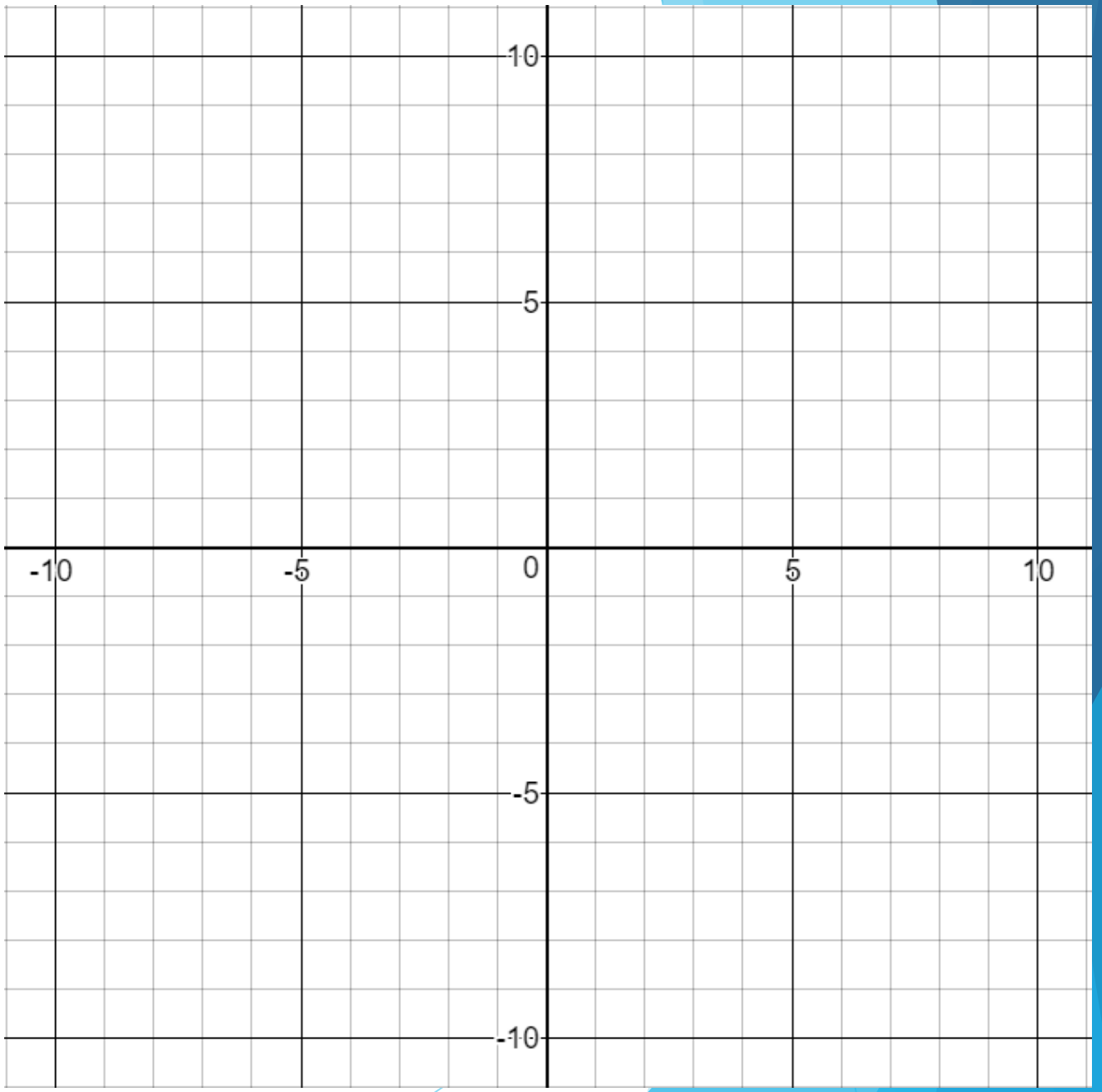
Plotting Points

- A *point* is a pair of numbers: (x, y). The numbers give us the location of the point on a graph.
- We always start from the *origin*, where the axes meet. It is the point $(0,0)$
- 1st number: How far right (positive) or left (negative) from the origin
- 2nd number: How far up (positive) or down (negative) from the origin.



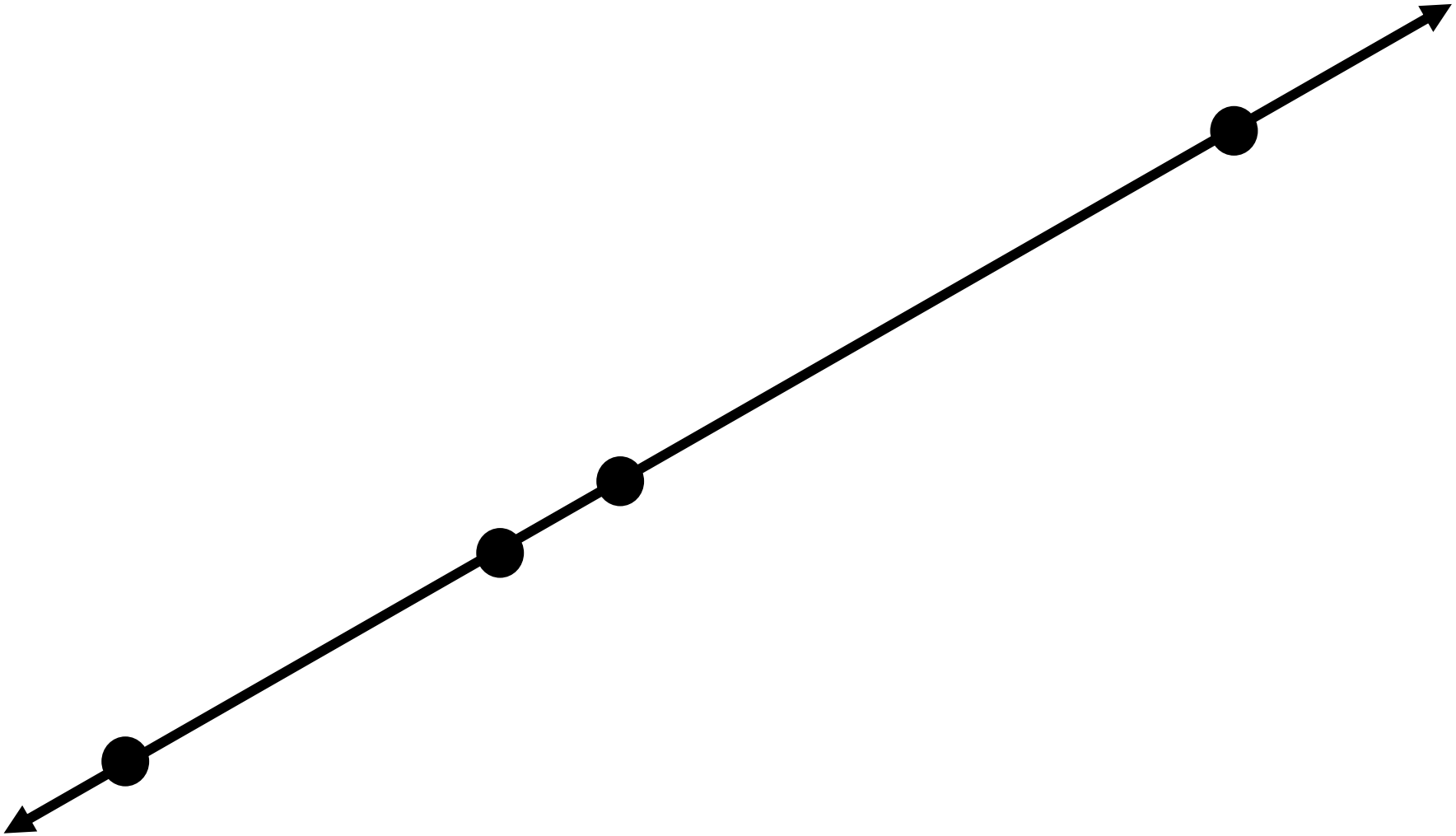
Plot the Points

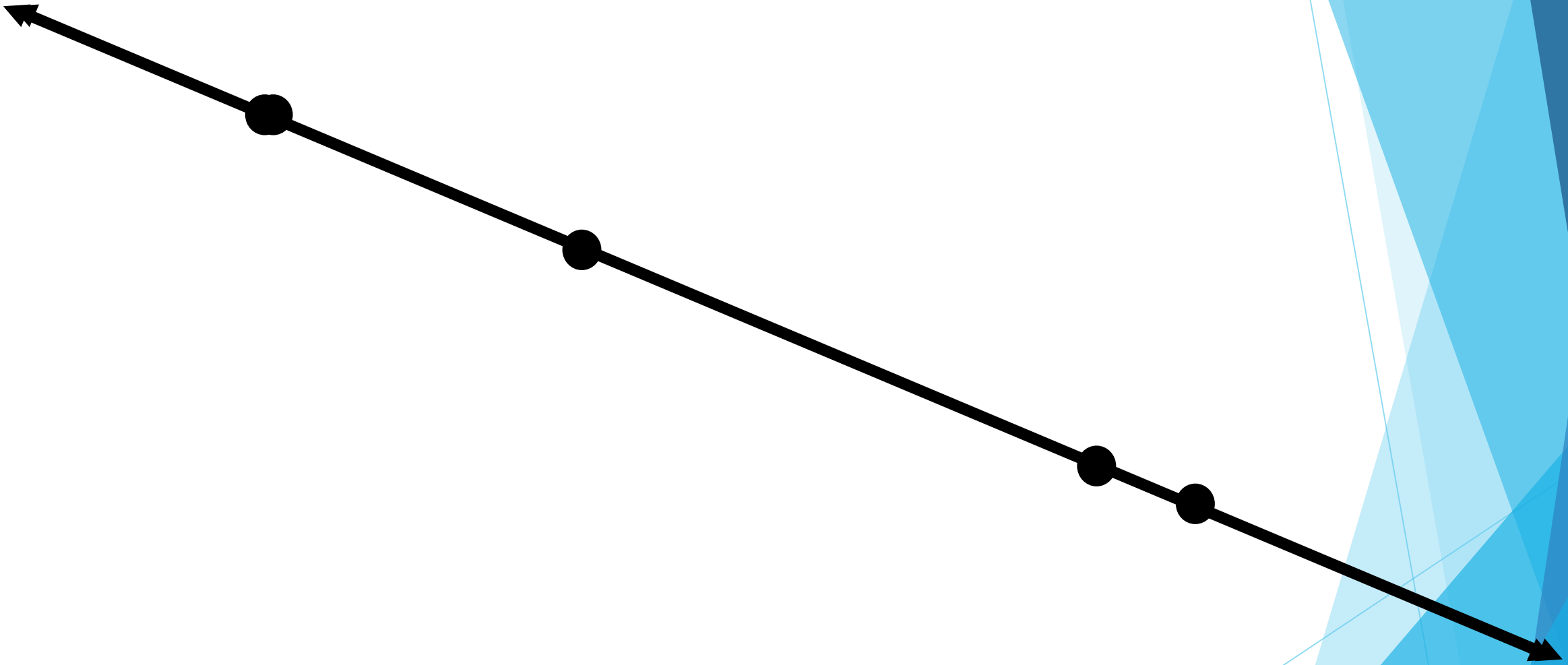
1. $(-4, -4)$
2. $(-4, -2)$
3. $(-4, 0)$
4. $(-4, 2)$
5. $(-3,3)$
6. $(-2,4)$
7. $(-1,5)$
8. $(0,4)$
9. $(1,3)$
10. $(2,2)$
11. $(2,0)$
12. $(2, -2)$
13. $(2, -4)$
14. $(4, -3)$
15. $(6, -2)$
16. $(8, -1)$
17. $(8,1)$
18. $(8,3)$
19. $(8,5)$
20. $(5,8)$
21. $(3,7)$
22. $(1,6)$
23. $(-1,2)$
24. $(0,2)$
25. $(4,3)$
26. $(6,4)$

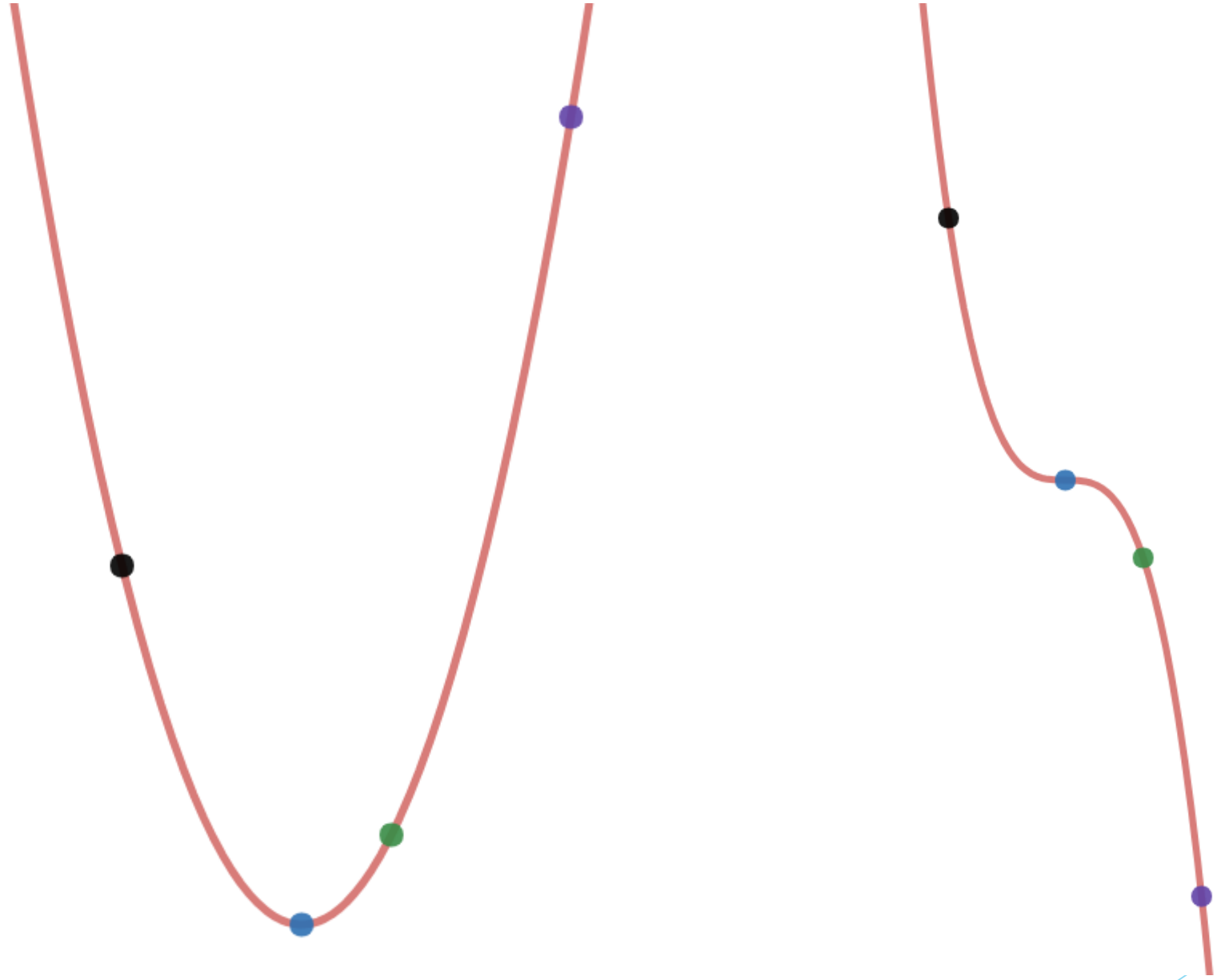


Rate of Change

- Often in math, we want to compare how two different quantities are changing.
- $rate\ of\ change = \frac{change\ in\ dependent\ variable}{change\ in\ independent\ variable}$
- $rate\ of\ change = \frac{change\ in\ y}{change\ in\ x}$
- $rate\ of\ change = \frac{\Delta y}{\Delta x}$
- $rate\ of\ change =$







Rate of Change for Lines vs. Other Shapes

- Notice that the rate of change was *always the same* on the first line – it didn't matter what points we picked!
- This wasn't the case with the other shapes.
- Because rate of change is *always* the same for a given line, it has a special name when used for a line.
- **Slope**: the rate of change on a line

The Slope Formula

- $slope = \frac{change\ in\ y}{change\ in\ x}$
- $m = \frac{\Delta y}{\Delta x}$

- $m = \frac{y_2 - y_1}{x_2 - x_1}$

- Remember that points are *always* (x, y)
- An **undefined slope** is $\frac{\#}{0}$

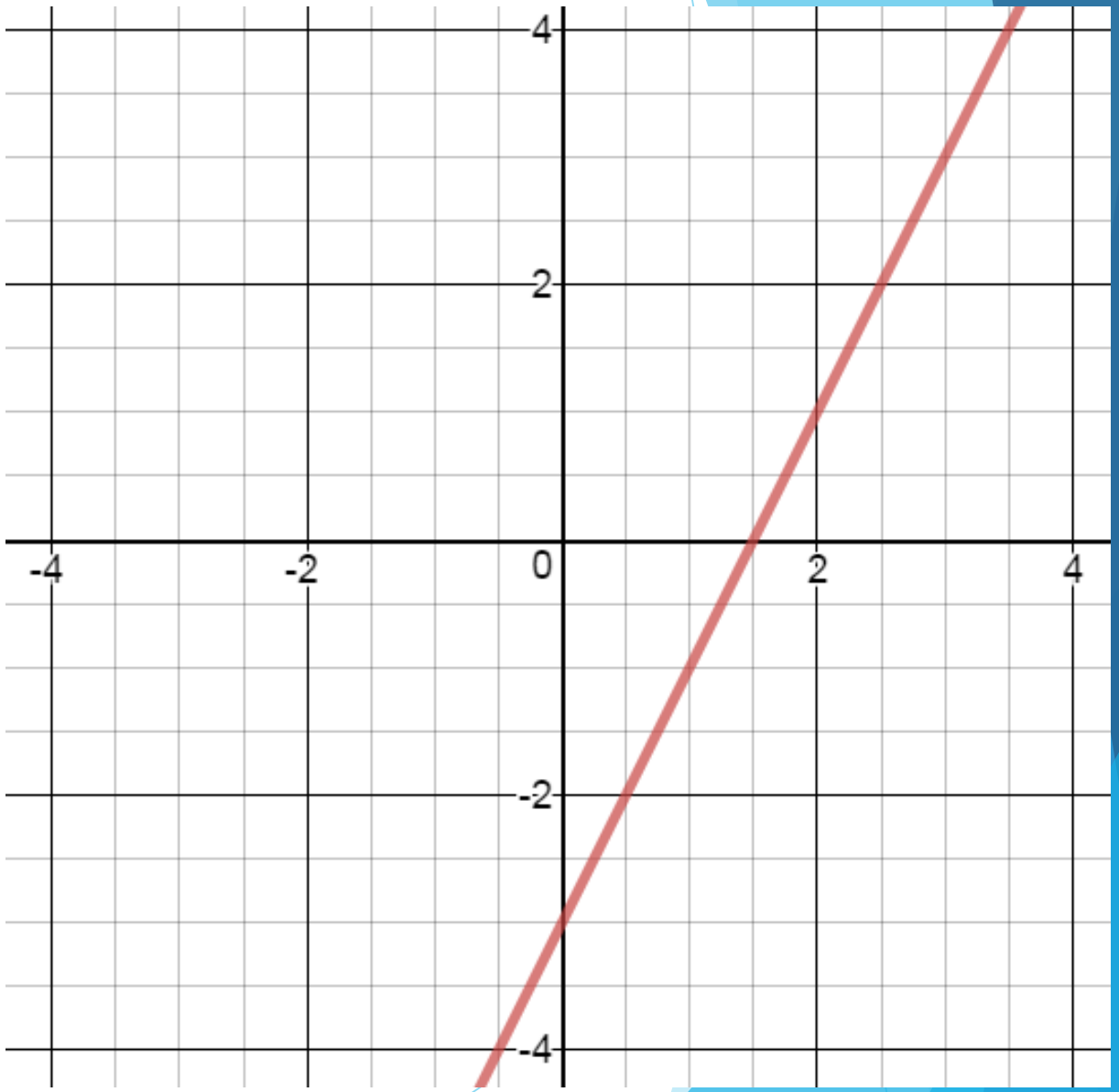
- $(3,4)$ and $(8,6)$

- $(-1, 0)$ and $(5, 6)$

Slope from a Graph

- Choose any 2 points from the line
- Use the slope formula!

- Or: Count the number of units up and across
  - *Up* is *positive*; *Down* is *negative*
  - *Right* is *positive*; *Left* is *negative*



Algebra 1 Name_____

CW14: Rate-of-Change

Period____

1) What is the formula for rate of change/slope?

Find the slope of the line through each pair of points. Be sure to reduce your fractions!

2) $(3, -2), (14, 6)$

3) $(-18, -19), (13, -9)$

4) $(-14, 1), (-14, 19)$

5) $(-9, -2), (6, 7)$

6) $(20, 6), (6, -7)$

7) $(15, 15), (4, -6)$

8) $(2, 12), (14, 12)$

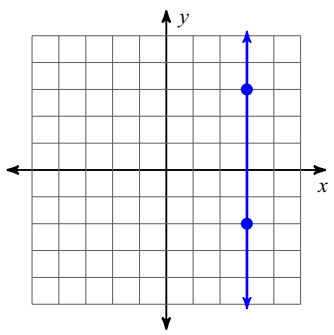
9) $(-10, -6), (11, -4)$

10) $(17, -13), (-17, -15)$

11) $(11, 11), (1, 9)$

Find the slope of each line.

12)



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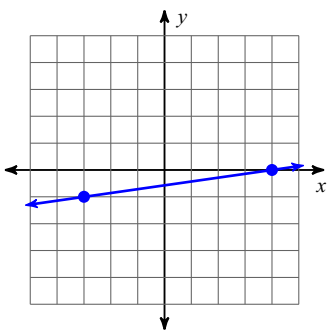

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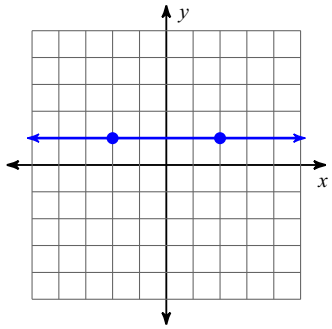

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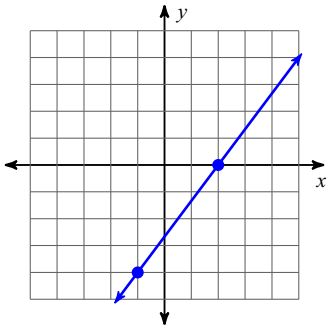

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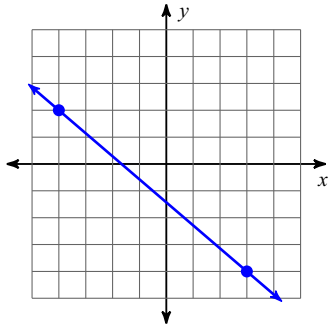

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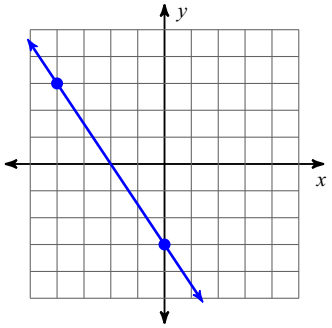

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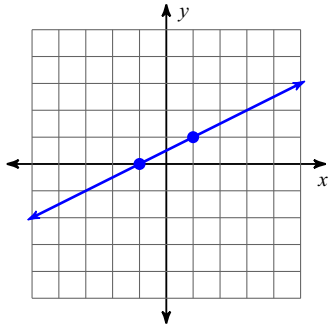

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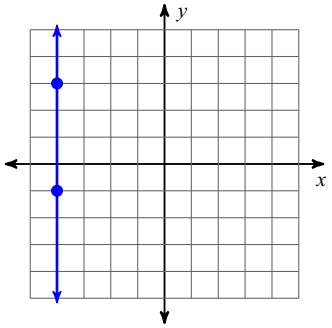

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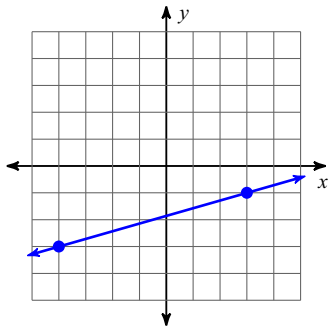

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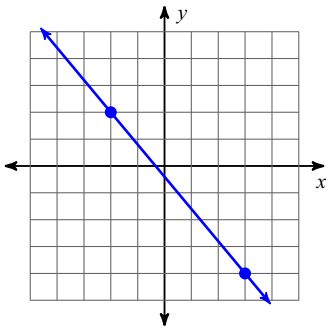

Answers to CW14: Rate-of-Change

1)

2) $\frac{8}{11}$

3) $\frac{10}{31}$

4) Undefined

5) $\frac{3}{5}$

6) $\frac{13}{14}$

7) $\frac{21}{11}$

8) 0

9) $\frac{2}{21}$

10) $\frac{1}{17}$

11) $\frac{1}{5}$

12) Undefined

13) $\frac{1}{7}$

14) 0

15) $\frac{4}{3}$

16) $-\frac{6}{7}$

17) $-\frac{3}{2}$

18) $\frac{1}{2}$

19) Undefined

20) $\frac{2}{7}$

21) $-\frac{6}{5}$