

Coding Assignment #2 – Linear Relationships

Learning Goals: apply coding skills to represent mathematical concepts and relationships related to linear functions.

Success Criteria: be able to create a program using Scratch to find the point of intersection of two lines.

Task 1: Read this block of code. What do you think it does? Explain in detail then try it using the link to see if you are right.

<https://scratch.mit.edu/projects/792456407>

```
when green flag clicked
  set slope to 0
  set y-int to 0
  switch costume to costume1
  set size to 100%
  erase all
  pen up
  set x to 0
  set y to 0
  ask "What is the rise of your slope" and wait
  set rise to answer
  ask "What is the run of your slope" and wait
  set run to answer
  set slope to rise / run
  ask "What is the y-intercept of your line" and wait
  set y-int to answer
  switch costume to Ball-d
  set x to -240
  set y to x position * slope + y-int
  set x to -240
  set y to x * slope + y-int
  set size to 25%
  pen down
  set pen size to 3
  repeat 480
    change x by 1
    set y to x * slope + y-int
    go to x: x y: y
```

What does the program do?

Task 2: Write pseudocode that would tell a program how to convert a standard form equation, $Ax + By + C = 0$, to a slope y -intercept form equation, $y = mx + b$.

Pseudo code:

MTH1W

Task 3: As a class, create a program in Scratch that converts a standard form equation, $Ax + By + C = 0$, to a slope y -intercept form equation, $y = mx + b$.

Task 4: In groups, analyze this program that graphs a line, plots a point, and then states if the point is on the line or not. Press 'See Inside' and analyze the code and backdrops to get an idea of how it works.

<https://scratch.mit.edu/projects/792574513>

Task 5: Write a program that graphs 2 lines and states where they intersect. Start with pseudo code and share the link to your program with your teacher when you are done.

Pseudo code:

| Category | Level 1 | Level 2 | Level 3 | Level 4 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Knowledge and Understanding Demonstrates knowledge and understanding of powers, exponent rules, and block coding. | demonstrates limited understanding of content | demonstrates some understanding of content | demonstrates considerable understanding of content | demonstrates thorough understanding of content |
| Thinking Use of planning using pseudo code. Shows critical/creative thinking when designing program. | uses planning skills with limited effectiveness | uses planning skills with some effectiveness | uses planning skills with considerable effectiveness | uses planning skills with a high degree of effectiveness |
| Communication Able to use block code to create a program that clearly communicates knowledge of exponent rules. | expresses and organizes ideas and information with limited effectiveness | expresses and organizes ideas and information with some effectiveness | expresses and organizes ideas and information with considerable effectiveness | expresses and organizes ideas and information with a high degree of effectiveness |
| Application Transfer knowledge and skills of how to use coding to evaluate powers to create a new program that applies the quotient rules of powers. | transfers knowledge and skills to new contexts with limited effectiveness | transfers knowledge and skills to new contexts with some effectiveness | transfers knowledge and skills to new contexts with considerable effectiveness | transfers knowledge and skills to new contexts with a high degree of effectiveness |

Comments: