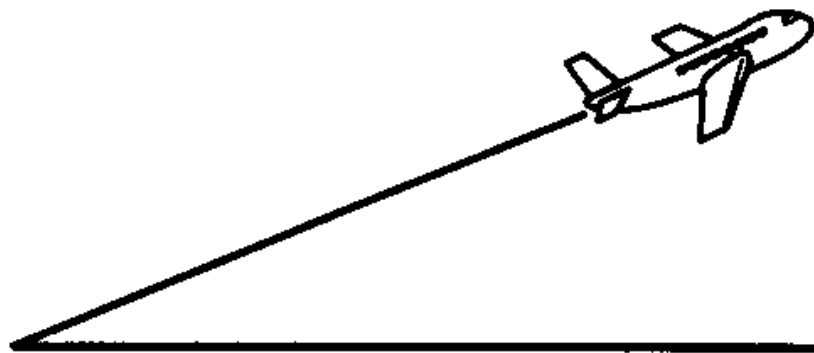# Chapter 1
Linear Functions

1. Parent Functions and Transformations

2. Transformations of Linear and Absolute Value Functions

3. **Modeling with Linear Functions**

4. Solving Linear Systems
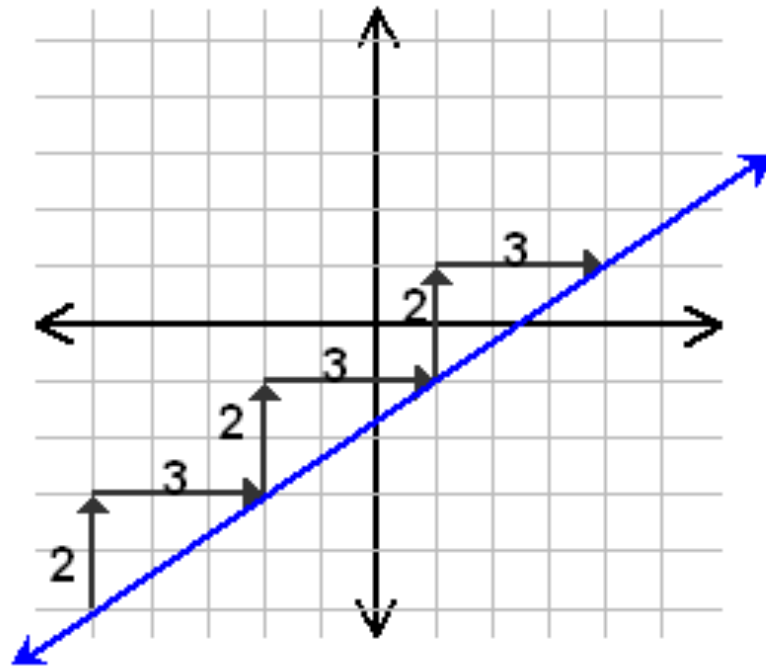
1.3 - Modeling with Linear Functions

Examples

= Slope

1.3 - Modeling with Linear Functions

Graphically

Rise = 2
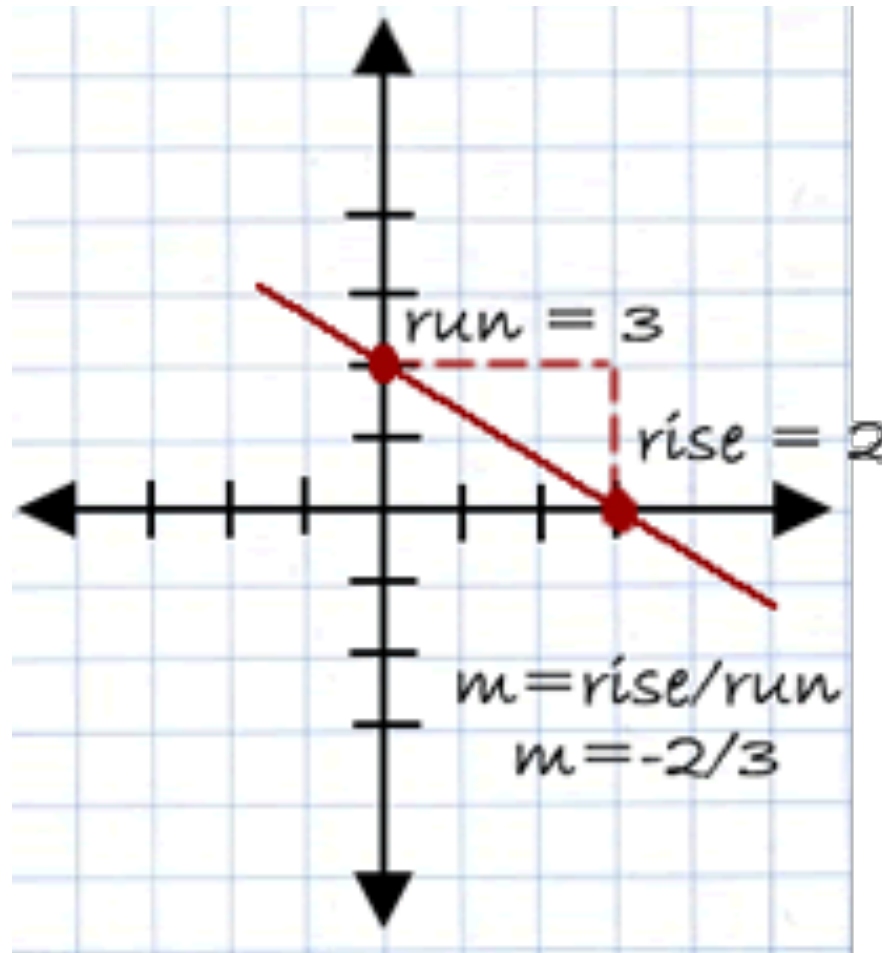
Run = 3

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{2}{3}$$
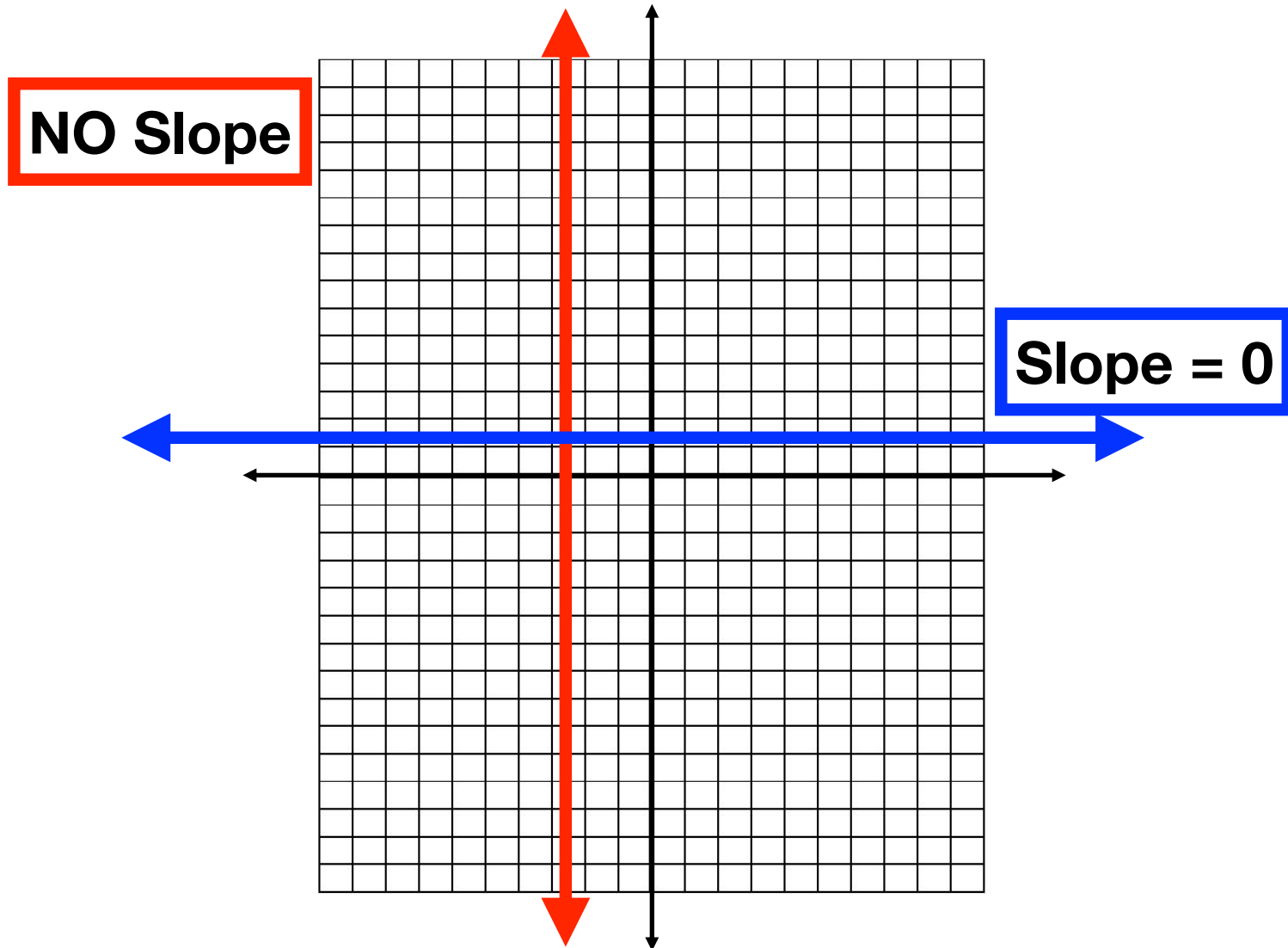
1.3 - Modeling with Linear Functions

Graphically

run = 3

rise = 2

m=rise/run

m=-2/3

1.3 - Modeling with Linear Functions

Two BIG exceptions

NO Slope

Slope = 0

1.3 - Modeling with Linear Functions

Find the slope of each line.

5.

6.

7.

8.

9.

10.
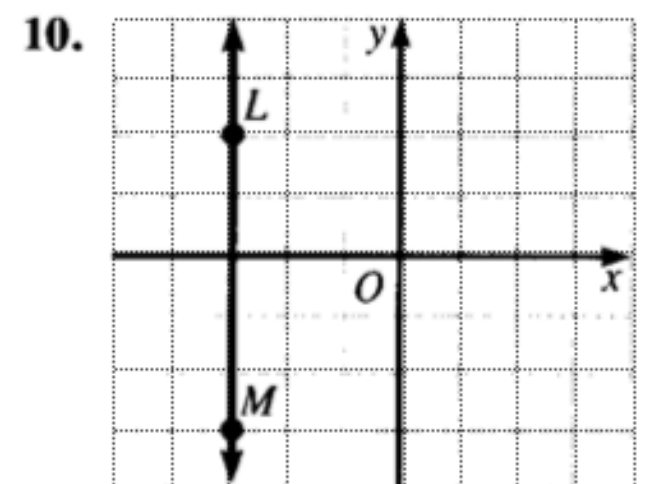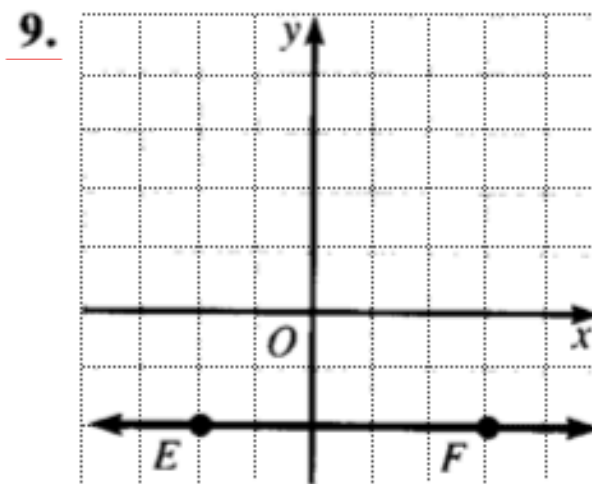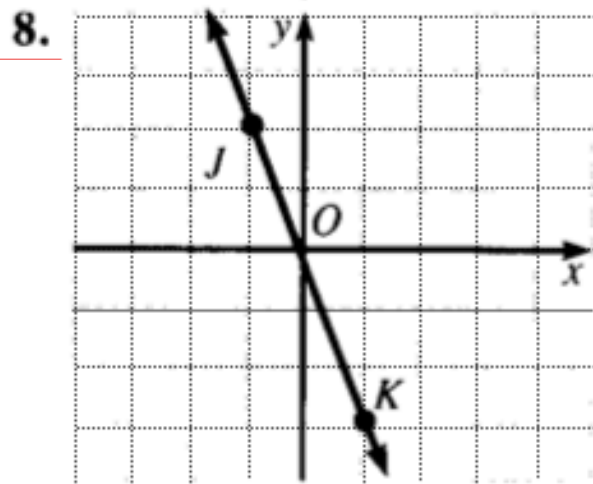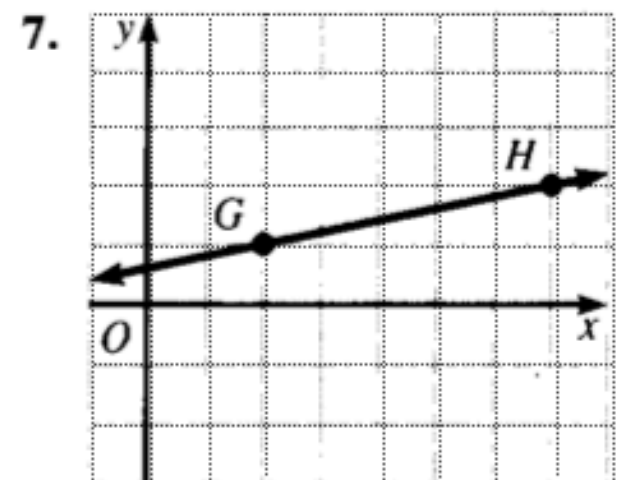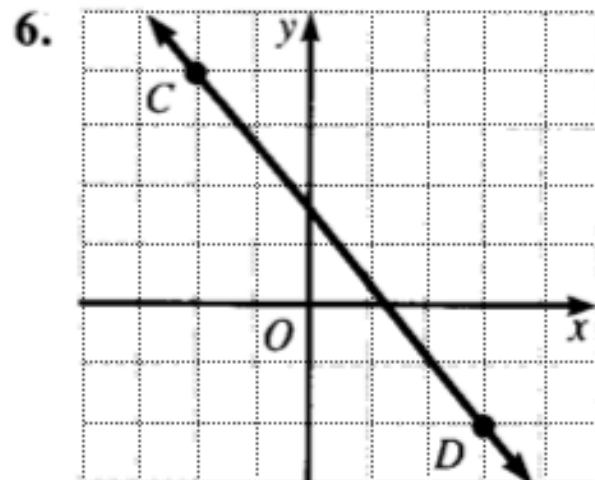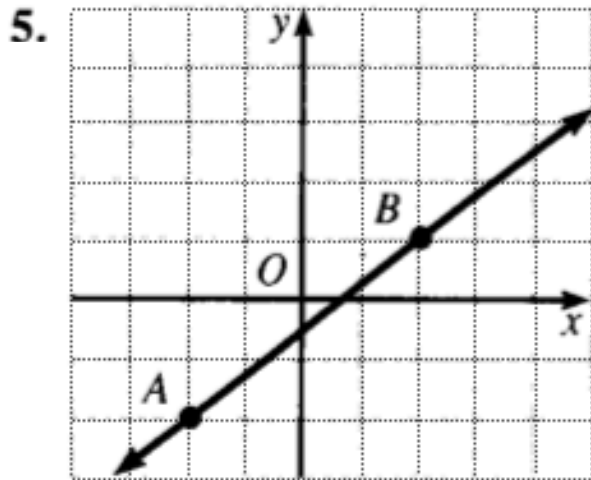
1.3 - Modeling with Linear Functions

Finding Slopes Algebraically

1.3 - Modeling with Linear Functions

$$\text{slope} = \frac{y(B) - y(A)}{x(B) - x(A)} = \frac{5 - 2}{8 - 2} = \frac{3}{6} = 0.5$$

B = (8, 5)

Rise = 3

A = (2, 2)

Run = 6

note: x(B) means the x-coordinate of point B
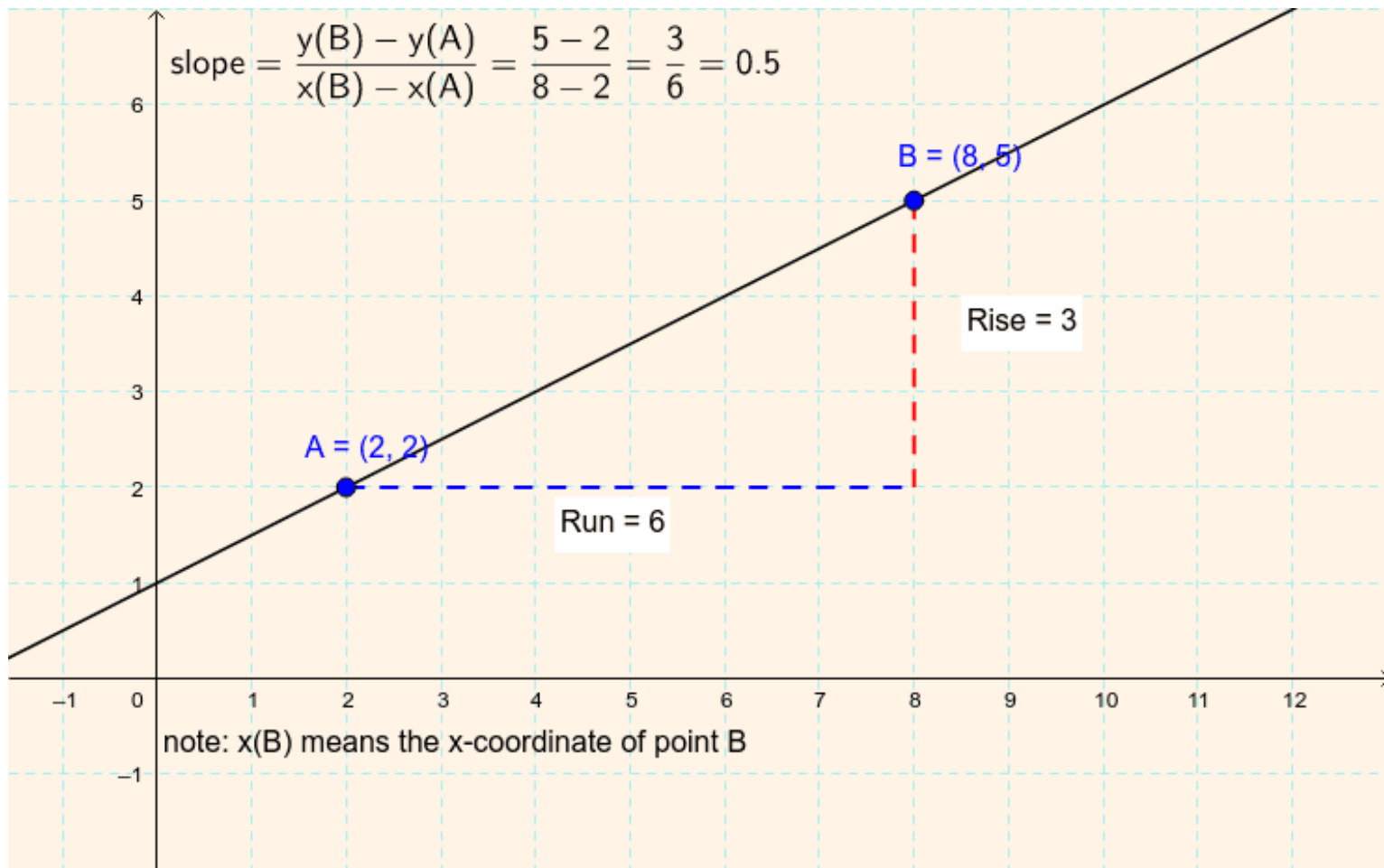
1.3 - Modeling with Linear Functions

Two exceptions

Find the slope of each line.

a. $y = 3$

b. $x = 4$

1.3 - Modeling with Linear Functions

Find the slope of the line through the points named. If the slope is not defined, write *not defined*.

3. (1, 2); (3, 4)

4. (1, 2); (−2, −5)

5. (1, 2); (−2, 5)

6. (0, 0); (5, 1)

7. (7, 2); (2, 7)

8. (3, 3); (3, 7)

9. (6, −6); (−6, −6)

10. (6, −6); (4, 3)

11. (−4, −3); (−6, −6)

Find the slope and length of $\overline{AB}$.

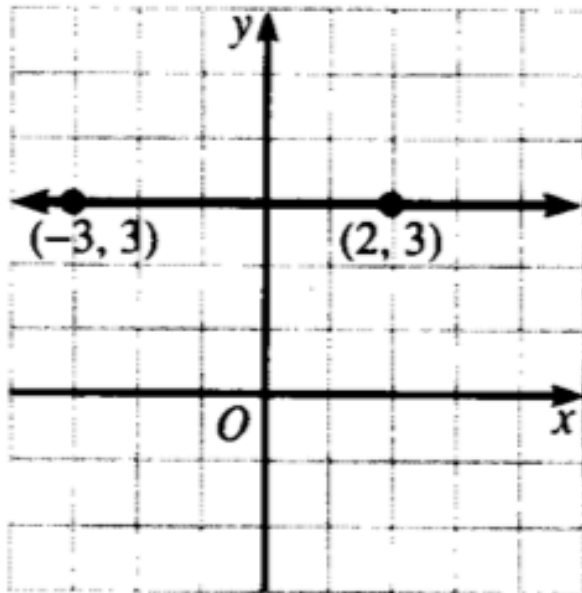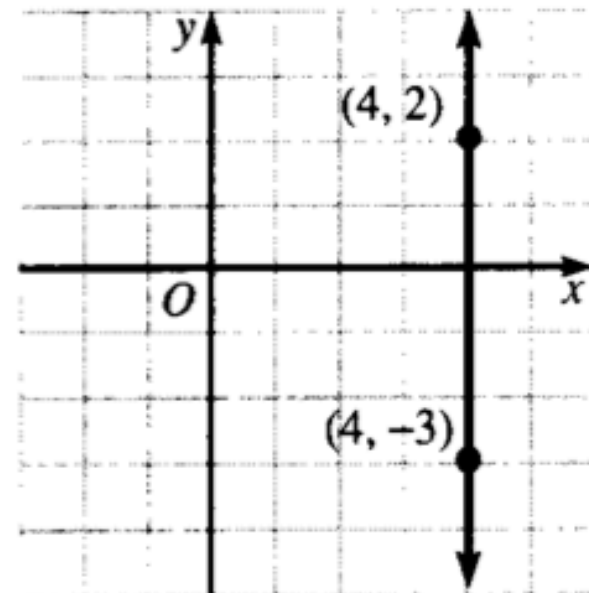# 1.3 - Modeling with Linear Functions

Graphing with Slopes

1.3 - Modeling with Linear Functions

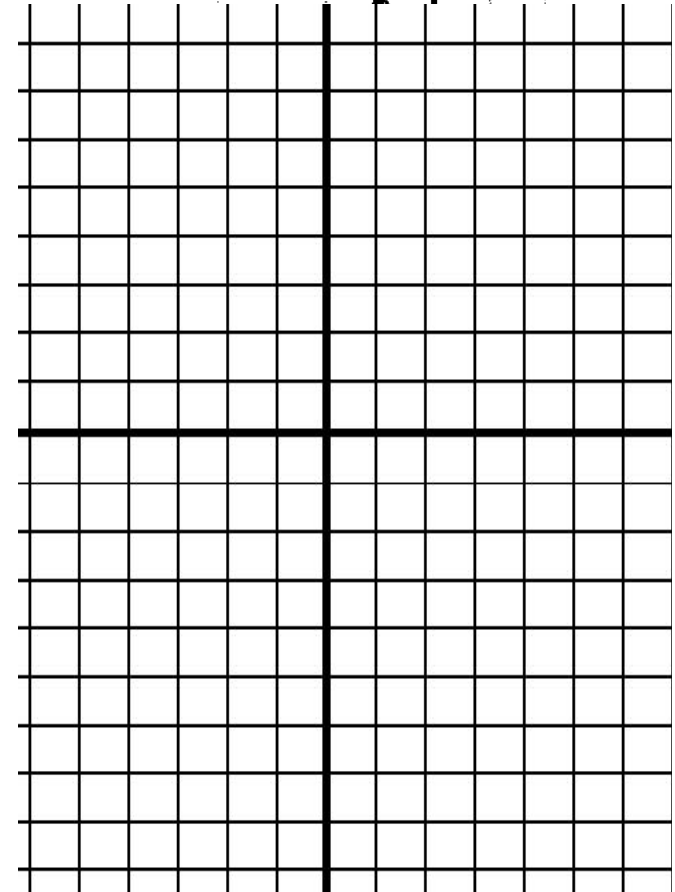**Through the given point, draw a line with the given slope.**
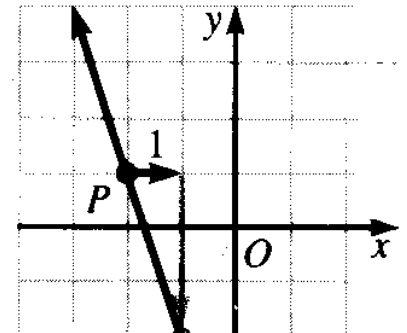
Sample $P(-2, 1)$; slope -3

Solution

1. Plot point P.

2. Write the slope as $\dfrac{-3}{1}$.

   From P, measure 1 unit to the right and 3 units down to locate a second point, T.

   Draw the line through P and T.

1.3 - Modeling with Linear Functions
Graph

16. $(5, 2)$; slope $= 3$

17. $(-2, 1)$; slope $= -2$

18. $(1, -1)$; slope $= \frac{2}{3}$

19. $(3, -2)$; slope $= -\frac{3}{2}$

20. $(3, -1)$; slope $= 0$

21. $(-2, -1)$; undefined slope

16.

17.

18.

19.

20.

21.