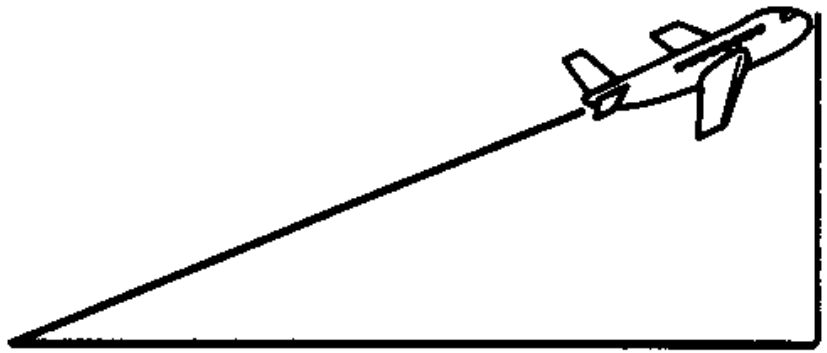
Chapter 1
Linear Functions

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

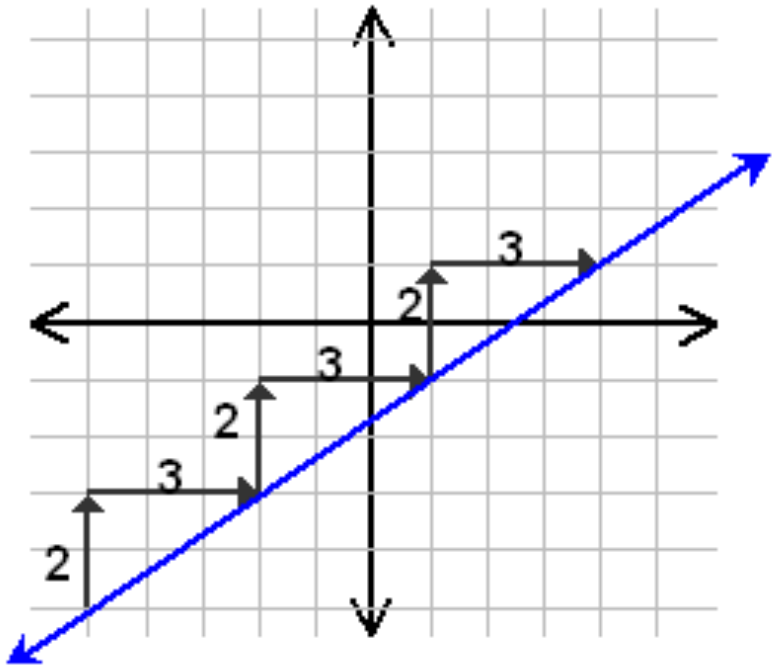
Examples



= Slope

1.3 - Modeling with Linear Functions

Graphically



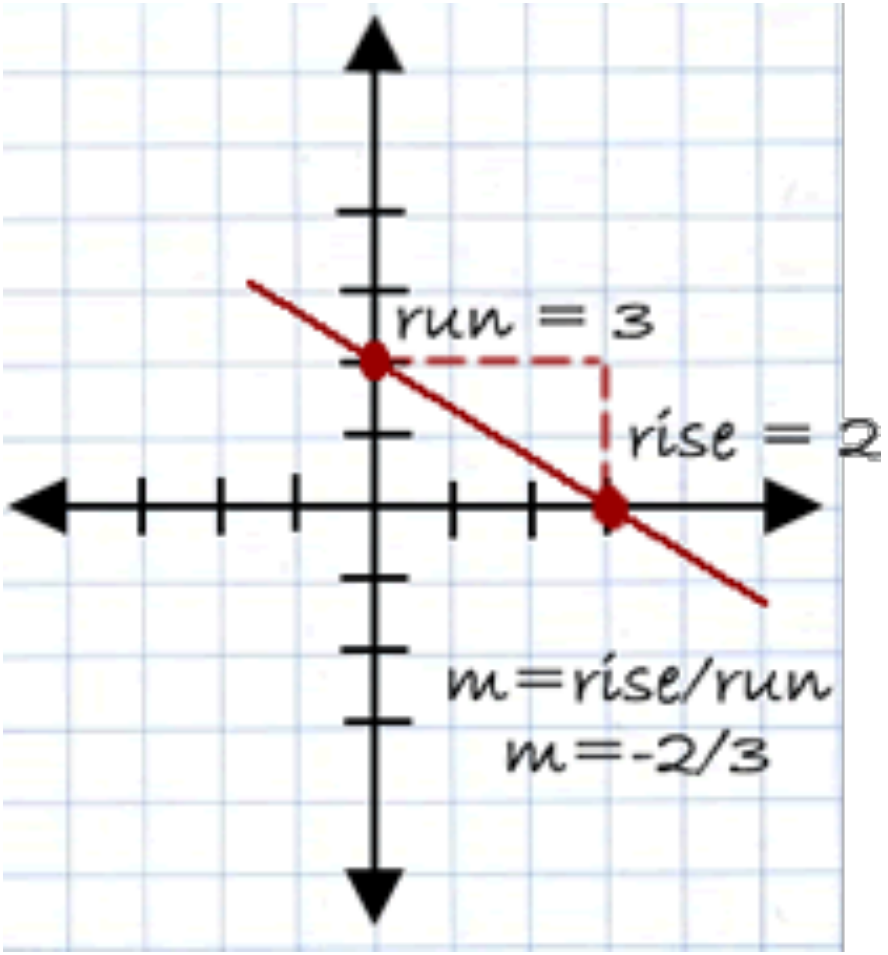
Rise = 2

Run = 3

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{2}{3}$$

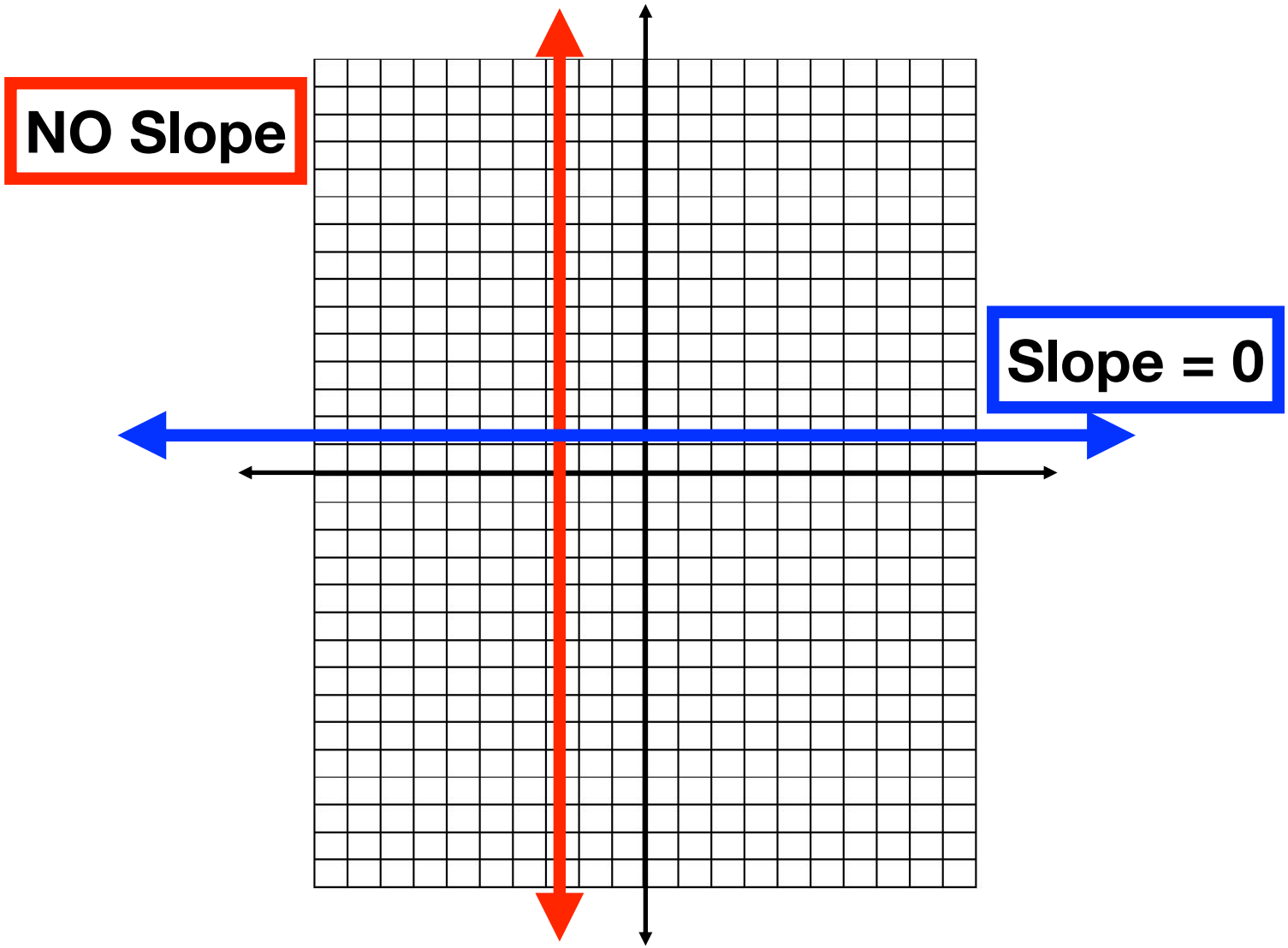
1.3 - Modeling with Linear Functions

Graphically



1.3 - Modeling with Linear Functions

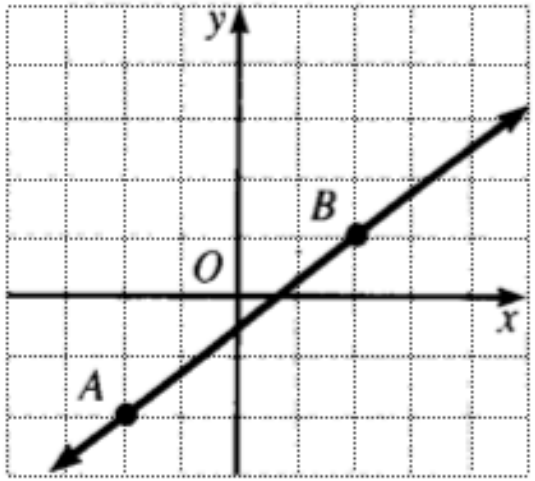
Two BIG exceptions



1.3 - Modeling with Linear Functions

Find the slope of each line.

5.



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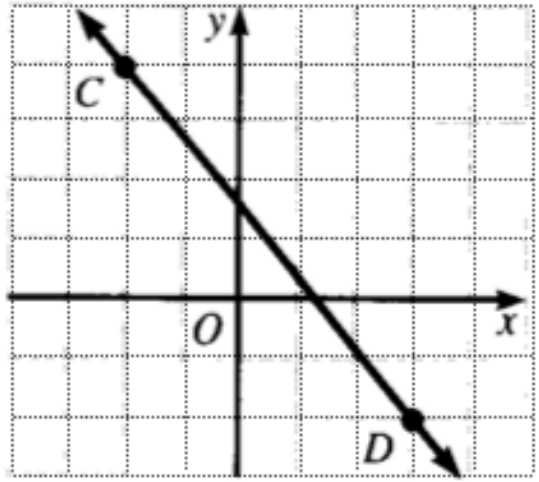

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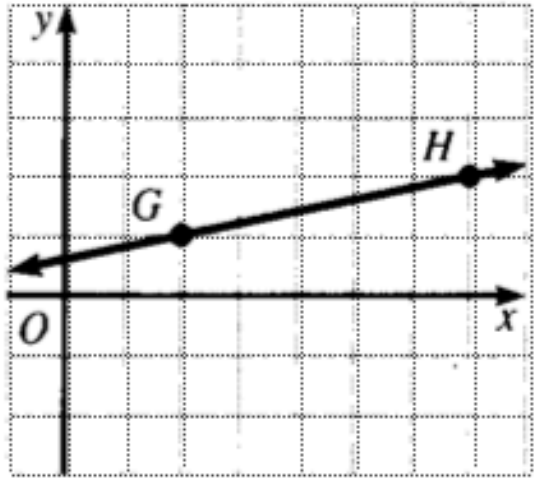

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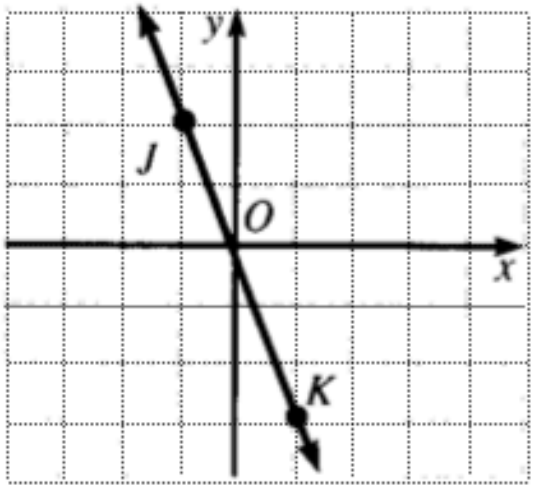

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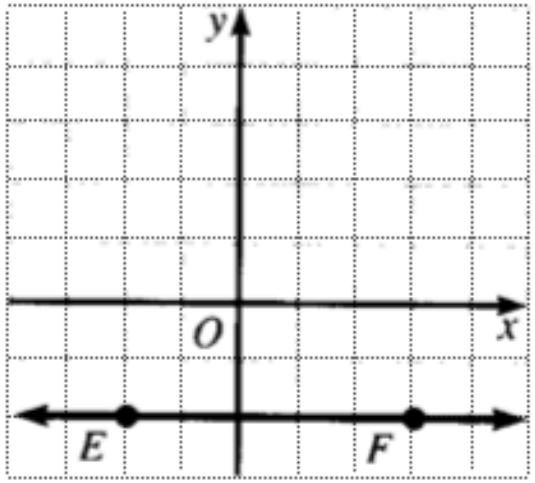

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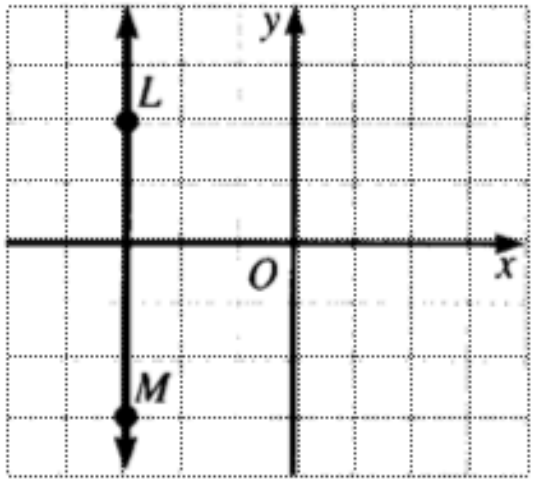
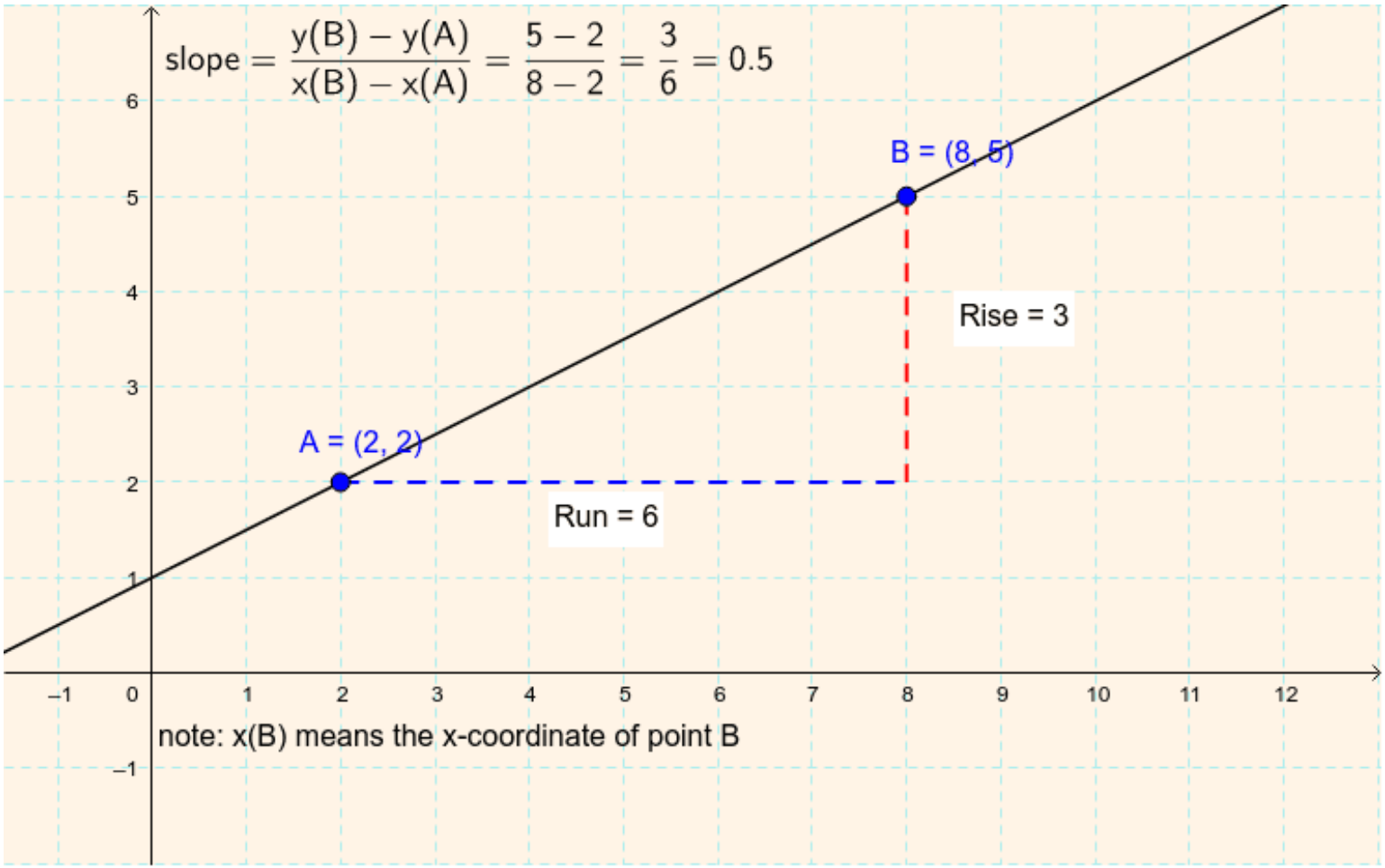


1.3 - Modeling with Linear Functions

Finding Slopes Algebraically

1.3 - Modeling with Linear Functions

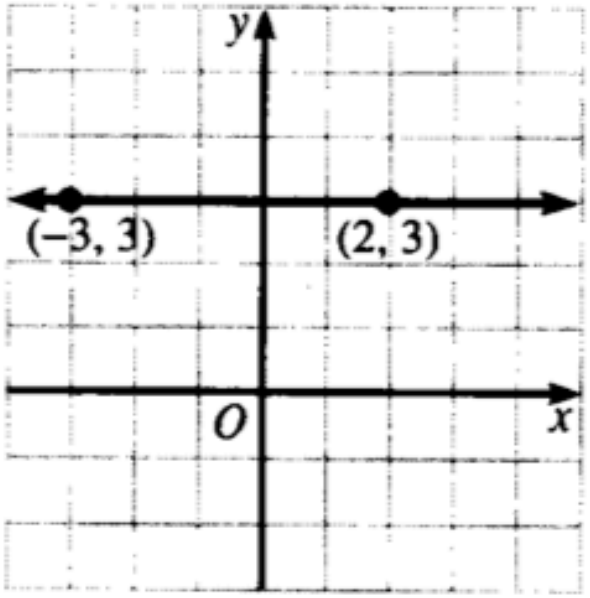


1.3 - Modeling with Linear Functions

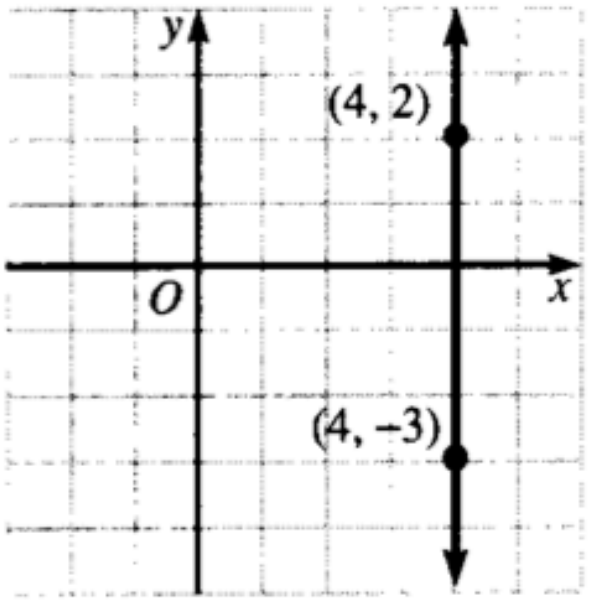
Two exceptions

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.

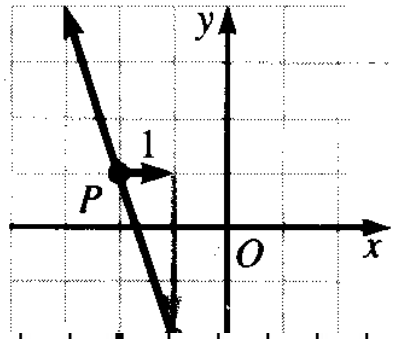
Sample $P(-2, 1)$; slope -3

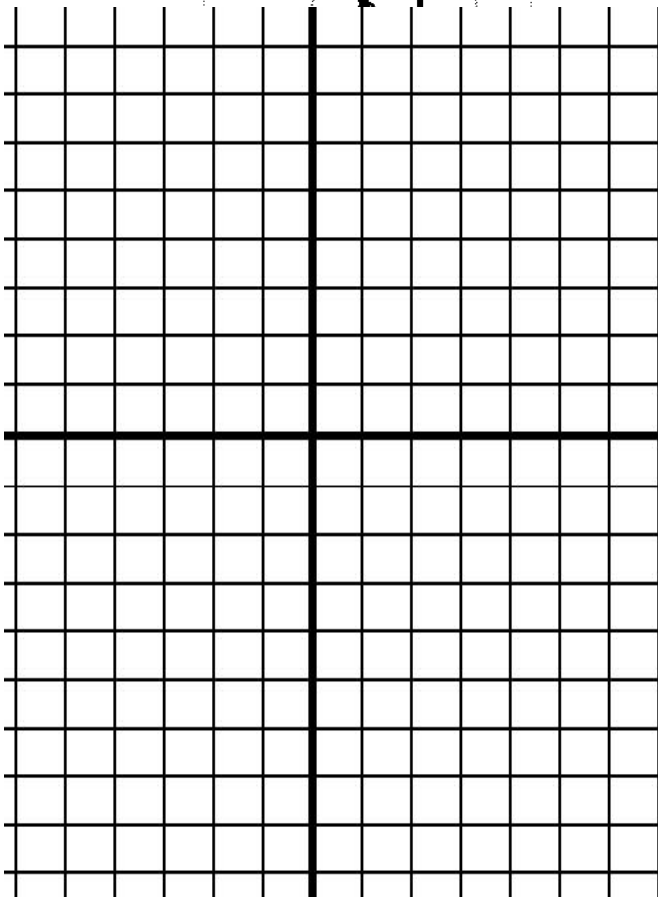
Solution

1. Plot point P.
2. Write the slope as $\frac{-3}{1}$.

   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 $= -2$

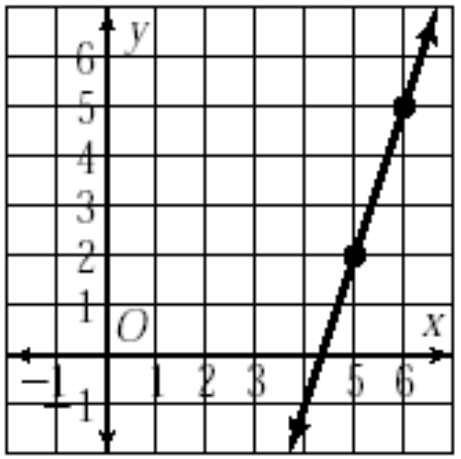
18. $(1, -1)$; slope $= \frac{2}{3}$

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

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

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

16.



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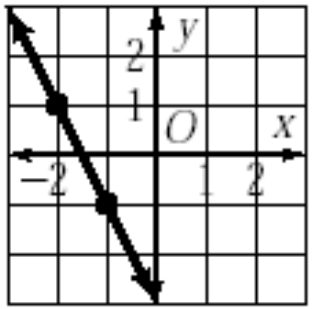

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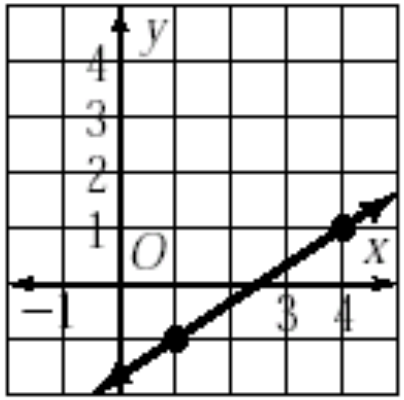

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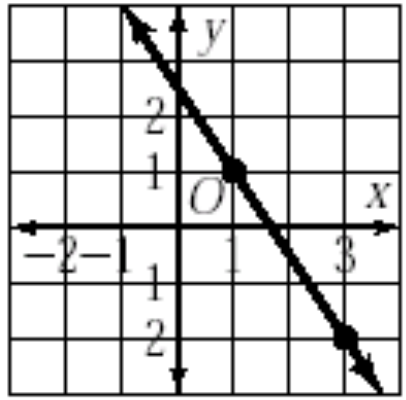

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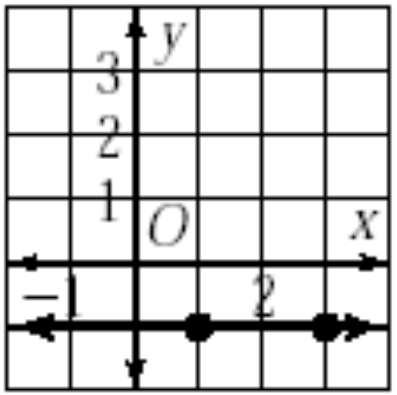
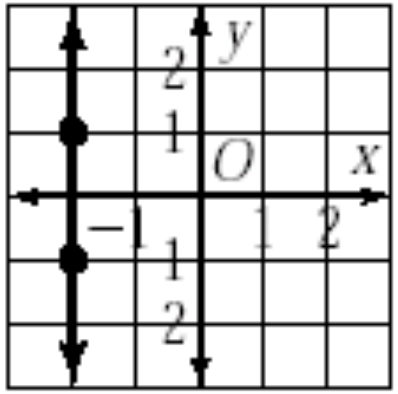
21.