

**Graphing Calculator Activity**

For use with pages 241–247

**GOAL**

To determine whether two different lines in the same plane are parallel.

Two different lines in the same plane are parallel if they do not intersect. In a coordinate plane, any two vertical lines are parallel. Any two nonvertical lines are parallel if and only if they have the same slope.

A graphing calculator can be used to visually check whether two different lines are parallel. If the lines are not parallel, you can use the graphing calculator's **TRACE** and **ZOOM** features to determine where the lines intersect.

**Activity**

- ① Enter each equation into your graphing calculator.

line  $a$ :  $y = 4$

line  $b$ :  $y = 4x$

line  $c$ :  $y = \frac{1}{4}x + 1$

line  $d$ :  $y = 4x + 4$

line  $e$ :  $y = -4x + 3$

line  $f$ :  $y = 4x - 8$

- ② Plot the graph of each equation in the same coordinate plane.
- ③ Visually check which lines are parallel. What do their equations have in common?
- ④ For lines that are not parallel, determine where the lines intersect using the **TRACE** and **ZOOM** features.

**Exercises**

1. Determine the unknown slope that would make the lines parallel. Then use your graphing calculator to visually check your answer.

a.  $y = 3x + 2$

b.  $y = -5x + 1$

c.  $y = \frac{2}{3}x - 0.9$

$y = \underline{\quad}x$

$y = \underline{\quad}x$

$y = \underline{\quad}x$

2. For each part of Exercise 1, write equations of two other lines that are parallel to the original line. Then use your graphing calculator to visually check your answer.

See page 82 for keystrokes.

# Graphing Calculator Activity

For use with pages 241–247

## TI-82

Y= 4 ENTER  
 4 X,T,θ ENTER  
 ( 1 ÷ 4 ) X,T,θ + 1 ENTER  
 4 X,T,θ + 4 ENTER  
 (-) 4 X,T,θ + 3 ENTER  
 4 X,T,θ - 8 ENTER  
 ZOOM 6

Press TRACE and use the left and right arrow keys to move the trace cursor. Move the trace cursor to estimate the point where two lines intersect.

ZOOM 2 ENTER

Repeat the trace and zoom steps to get a more accurate estimate.

## SHARP EL-9600c

Y= 4 ENTER  
 4 X/θ/T/n ENTER  
 ( 1 ÷ 4 ) X/θ/T/n + 1 ENTER  
 4 X/θ/T/n + 4 ENTER  
 (-) 4 X/θ/T/n + 3 ENTER  
 4 X/θ/T/n - 8 ENTER  
 ZOOM [A] 5

Press TRACE and use the left and right arrow keys to move the trace cursor. Move the trace cursor to estimate the point where two lines intersect.

ZOOM [A] 3

Repeat the trace and zoom steps to get a more accurate estimate.

## TI-83

Y= 4 ENTER  
 4 X,T,θ ENTER  
 ( 1 ÷ 4 ) X,T,θ + 1 ENTER  
 4 X,T,θ,n + 4 ENTER  
 (-) 4 X,T,θ,n + 3 ENTER  
 4 X,T,θ,n - 8 ENTER  
 ZOOM 6

Press TRACE and use the left and right arrow keys to move the trace cursor. Move the trace cursor to estimate the point where two lines intersect.

ZOOM 2 ENTER

Repeat the trace and zoom steps to get a more accurate estimate.

## CASIO CFX-9850GA PLUS

From the main menu, choose GRAPH.

4 EXE  
 4 X,θ,T EXE  
 ( 1 ÷ 4 ) X,θ,T + 1 EXE  
 4 X,θ,T + 4 EXE  
 (-) 4 X,θ,T + 3 EXE  
 4 X,θ,T - 8 EXE  
 SHIFT F3 F3 EXIT F6

Press SHIFT F1 and use the left and right arrow keys to move the trace cursor. Move the trace cursor to estimate the point where two lines intersect.

SHIFT F2 F3

Repeat the trace and zoom steps to get a more accurate estimate.

**Graphing Calculator Activity Keystrokes**

For use with pages 250–251

**Keystrokes for Example 1****TI-82**

Y= ( 2 ÷ 3 ) X,T,θ - 11 ENTER  
 WINDOW (-) 10 ENTER 10 ENTER 1 ENTER  
 (-) 10 ENTER 10 ENTER 1 ENTER  
 GRAPH

Redefine values for viewing window.

WINDOW 0 ENTER 20 ENTER 1 ENTER  
 (-) 15 ENTER 5 ENTER 1 ENTER  
 GRAPH

**TI-83**

Y= ( 2 ÷ 3 ) X,T,θ,n - 11 ENTER  
 WINDOW (-) 10 ENTER 10 ENTER 1 ENTER  
 (-) 10 ENTER 10 ENTER 1 ENTER  
 GRAPH

Redefine values for viewing window.

WINDOW 0 ENTER 20 ENTER 1 ENTER  
 (-) 15 ENTER 5 ENTER 1 ENTER  
 GRAPH

**SHARP EL-9600c**

Y= ( 2 ÷ 3 ) X/θ/T/n - 11  
 WINDOW (-) 10 ENTER 10 ENTER 1 ENTER  
 (-) 10 ENTER 10 ENTER 1 ENTER  
 GRAPH

Redefine values for viewing window.

WINDOW 0 ENTER 20 ENTER 1 ENTER  
 (-) 15 ENTER 5 ENTER 1 ENTER  
 GRAPH

**CASIO CFX-9850GA PLUS**

From the main menu, choose GRAPH.

( 2 ÷ 3 ) X,θ,T - 11 EXE  
 SHIFT F3 (-) 10 EXE 10 EXE 1 EXE  
 (-) 10 EXE 10 EXE 1 EXE EXIT F6  
 GRAPH

Redefine values for viewing window.

SHIFT F3 0 EXE 20 EXE 1 EXE  
 (-) 15 EXE 5 EXE 1 EXE EXIT F6

# Graphing Calculator Activity Keystrokes

For use with pages 250–251

## Keystrokes for Example 2

### TI-82

Y= ( 2 ÷ 3 ) X,T,θ - 45 ÷ 8  
 ENTER  
 WINDOW (-) 10 ENTER 5  
 ENTER 1 ENTER (-) 15 ENTER  
 5 ENTER 1 ENTER TRACE

Use the left and right arrow keys to move the trace cursor. Move the trace cursor until the  $x$ -coordinate of the point is about  $-7$ . Use the zoom feature to get a more accurate estimate.

ZOOM 2 ENTER

Continue to use the trace and zoom features to get more accurate estimate.

### SHARP EL-9600c

Y= ( 2 ÷ 3 ) X/θ/T/n - 45 ÷ 8  
 ENTER  
 WINDOW (-) 10 ENTER 5  
 ENTER 1 ENTER (-) 15 ENTER  
 5 ENTER 1 ENTER TRACE

Use the left and right arrow keys to move the trace cursor. Move the trace cursor until the  $x$ -coordinate of the point is about  $-7$ . Use the zoom feature to get a more accurate estimate.

ZOOM [A]3

Continue to use the trace and zoom features to get more accurate estimate.

### CASIO CFX-9850GA PLUS

From the main menu, choose GRAPH

( 2 ÷ 3 ) X,θ,T - 45 ÷ 8 EXE  
 (-) 15 EXE 5 EXE 1 EXE EXIT F6  
 SHIFT F1

Use the left and right arrow keys to move the trace cursor. Move the trace cursor until the  $x$ -coordinate of the point is about  $-7$ . Use the zoom feature to get a more accurate estimate.

F2 F3

Continue to use the trace and zoom features to get more accurate estimate.