FINDING THE SLOPE FROM TWO POINTS
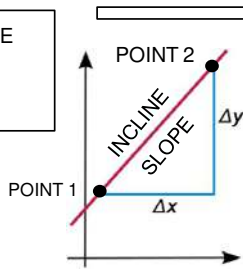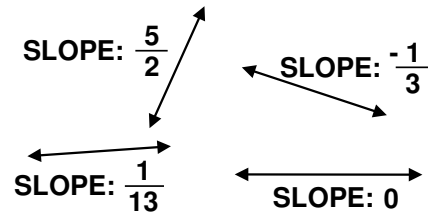
THE SLOPE OF A LINE DESCRIBES HOW STEEP IT IS OR THE SLANT OF THE LINE.

POINT 2
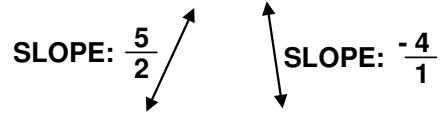
POINT 1

INCLINE
SLOPE
Δy
Δx

THE STEEPNESS OR SLANT OF A LINE BECOMES MORE FLAT AS THE SLOPE GETS CLOSER TO ZERO.

SLOPE: $\frac{5}{2}$

SLOPE: $\frac{-1}{3}$

SLOPE: $\frac{1}{13}$

SLOPE: 0

SEE HOW THE LINES GET MORE HORIZONTAL AS THE SLOPES APPROACH ZERO?

AS THE SLOPES GET FARTHER AND FARTHER AWAY FROM ZERO, THE LINES BECOME MORE AND MORE STEEP OR VERTICAL.

SLOPE: $\frac{5}{2}$

SLOPE: $\frac{-4}{1}$

SLOPE IS UNDEFINED

WHEN THE DENOMINATOR REACHES ZERO, THE SLOPE BECOMES UNDEFINED. IN MATHEMATICS WE CANNOT DIVIDE BY ZERO, SO THE ANSWER IS UNDEFINED.

$\frac{7}{0}$

A FRACTION CANNOT HAVE ZERO IN THE DENOMINATOR. REMEMBER, THIS IS ALSO DIVISION AND YOU CANNOT DIVIDE BY ZERO EITHER.

IT WOULD BE ALMOST IMPOSSIBLE TO RIDE A BIKE DOWN A VERTICAL HILL.

THE SLOPE CAN BE FOUND BY USING TWO POINTS ON A LINE.

HELPFUL EXAMPLE

TWO POINTS ON A LINE.

$(5 , 3) , (5 , - 2)$

RE-WRITE THE POINTS ON TOP OF EACH OTHER AND FIND THE DIFFERENCE BETWEEN THE TWO X AND Y COORDINATES.

(x , y)

$(5 , 3)$
$- (5 , - 2)$
_____
$0 , 5$

$\Delta x \quad \Delta y$

WHEN YOU SUBTRACT THE TWO Y-COORDINATES:
3 - (-2)
DON'T FORGET THAT THE TWO NEGATIVES CREATE A POSITIVE. SO IT'S ACTUALLY:
3 + 2 = 5

SLOPE

$\frac{\Delta y}{\Delta x} = \frac{5}{0}$

SLOPE IS UNDEFINED

YOU CANNOT HAVE ZERO IN THE DENOMINATOR SO THE **SLOPE IS UNDEFINED**.

NOW YOUR TURN. USE THE POINTS FROM EACH LINE TO DETERMINE ITS SLOPE.
WRITE IF THE SLOPE IS POSITIVE, NEGATIVE, ZERO, OR UNDEFINED.

1. $(- 2 , 0) , (5 , 3)$

$\frac{-3}{-7} = \frac{3}{7}$

$(-2 , 0)$
$- (5 , 3)$
_____
$-7 , -3$

THE SLOPE IS POSITIVE.
DO YOU KNOW WHY?

2. $(1 , 4) , (- 8 , - 4)$

$\frac{8}{9}$

$(1 , 4)$
$- (-8 , -4)$
_____
$9 , 8$

POSITIVE

3. $(10 , 2) , (7 , 2)$

$\frac{0}{3} = 0$

$(10 , 2)$
$- (7 , 2)$
_____
$3 , 0$

ZERO

4. $(9 , 6) , (1 , 4)$

$\frac{2}{8} = \frac{1}{4}$

$(9 , 6)$
$- (1 , 4)$
_____
$8 , 2$

POSITIVE

DON'T FORGET TO SIMPLIFY.

5. $(18 , 11) , (3 , 16)$

$\frac{-5}{15} = \frac{-1}{3}$

$(18 , 11)$
$- (3 , 16)$
_____
$15 , -5$

NEGATIVE

6. $(5 , 15) , (7 , 19)$

$\frac{-4}{-2} = 2$

$(5 , 15)$
$- (7 , 19)$
_____
$-2 , -4$

POSITIVE

7. $(- 8 , 10) , (- 2 , - 13)$

$\frac{23}{-6}$

$(-8 , 10)$
$- (-2 , -13)$
_____
$-6 , 23$

NEGATIVE

8. $(- 7 , - 4) , (- 7 , - 14)$

$\frac{10}{0} = $ NS

$(-7 , -4)$
$- (-7 , -14)$
_____
$0 , 10$

UNDEFINED

9. $(12 , - 17) , (24 , - 9)$

$\frac{-8}{-12} = \frac{2}{3}$

$(12 , -17)$
$- (24 , -9)$
_____
$-12 , -8$

POSITIVE

LEVEL 3