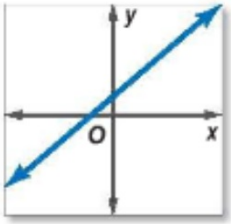
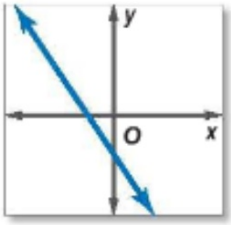
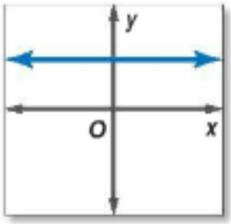
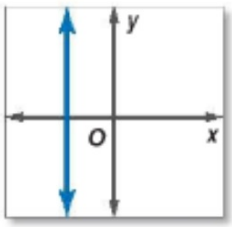
*8th grade standard
**Algebra 1 Ch. 5

Geometry 3.3
Calculate slopes of lines*
Use slope to identify parallel and perpendicular lines**
slope
rate of change
parallel //
perpendicular ⊥
slope song
whiteboards

$m = \frac{\text{vertical}}{\text{horiz}} = \frac{y\text{'s}}{x\text{'s}} = \frac{\text{rise}}{\text{run}}$

**ConceptSummary** Classifying Slopes

| Positive Slope | Negative Slope | Zero Slope | Undefined Slope |
|---|---|---|---|
|  |  |  |  |



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

## Postulates Parallel and Perpendicular Lines

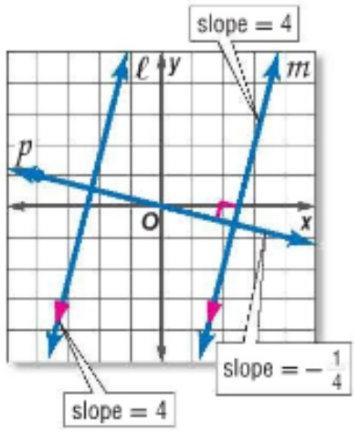
**3.2 Slopes of Parallel Lines** Two nonvertical lines have the same slope if and only if they are parallel. All vertical lines are parallel.

**Example** Parallel lines $\ell$ and $m$ have the same slope, 4.

**3.3 Slopes of Perpendicular Lines** Two nonvertical lines are perpendicular if and only if the product of their slopes is $-1$. Vertical and horizontal lines are perpendicular.

**Example** line $m \perp$ line $p$

product of slopes $= 4 \cdot -\frac{1}{4}$ or $-1$



Determine whether $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are *parallel, perpendicular,* or *neither.*
Graph each line to verify your answer.

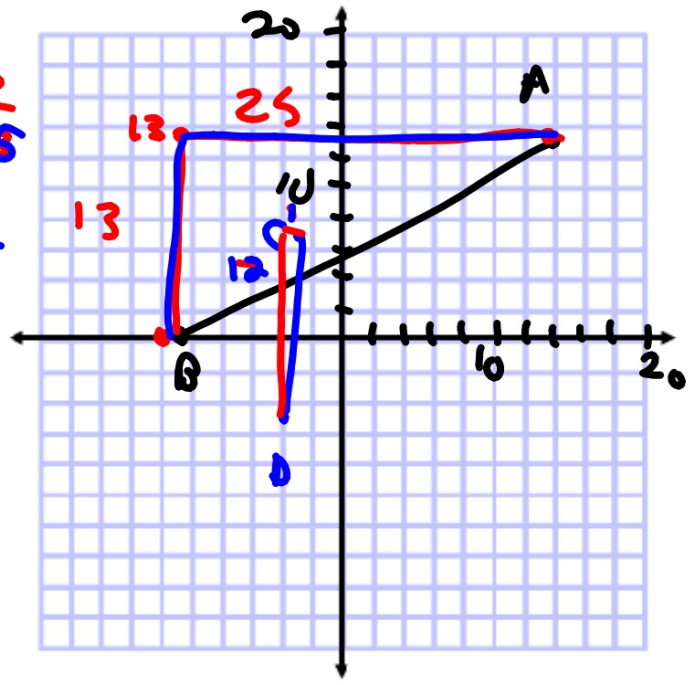
**3A.** $A(14, 13), B(-11, 0), C(-3, 7), D(-4, -5)$

**3B.** $A(3, 6), B(-9, 2), C(5, 4), D(2, 3)$

$m\overline{AB} = \frac{0-13}{-11-14} = \frac{-13}{-25} = \frac{13}{25}$

$m\overline{CD} = \frac{-5+7}{-4+3} = \frac{-12}{-1} = \frac{12}{1}$

not $\perp$
not $\parallel$



4. Graph the line that contains $P(0, 1)$ and is perpendicular to $\overleftrightarrow{QR}$ with $Q(-6, -2)$ and $R(0, -6)$.

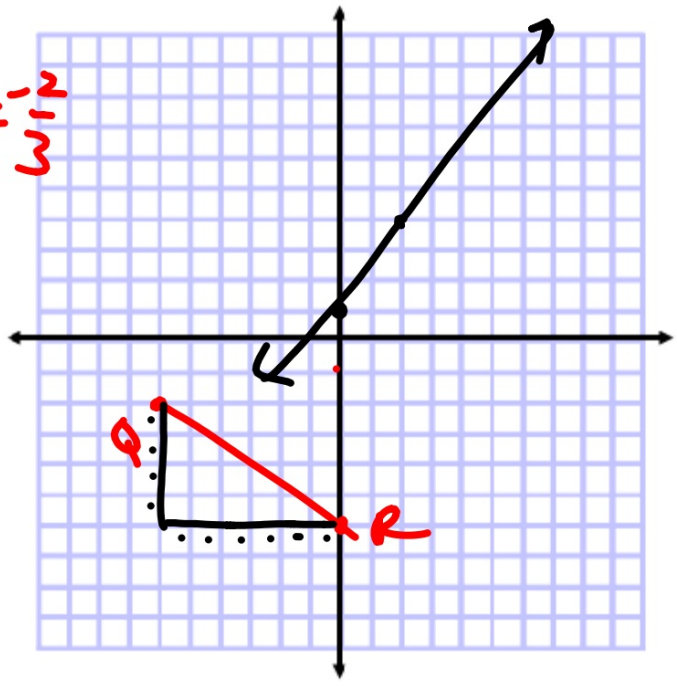
$m = \frac{3}{2}$

$m = -\frac{2}{3}$

$-\frac{1}{6}$

$m_{\overline{QR}} = \frac{-6+2}{0+6} = \frac{-4}{6} = -\frac{2}{3}$

$-\frac{4}{1}$



WB 3.3
prac.