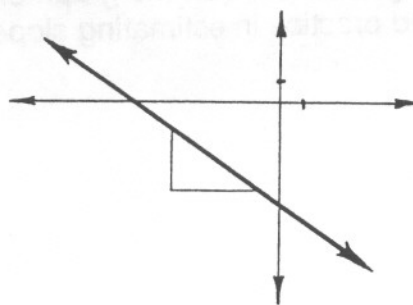
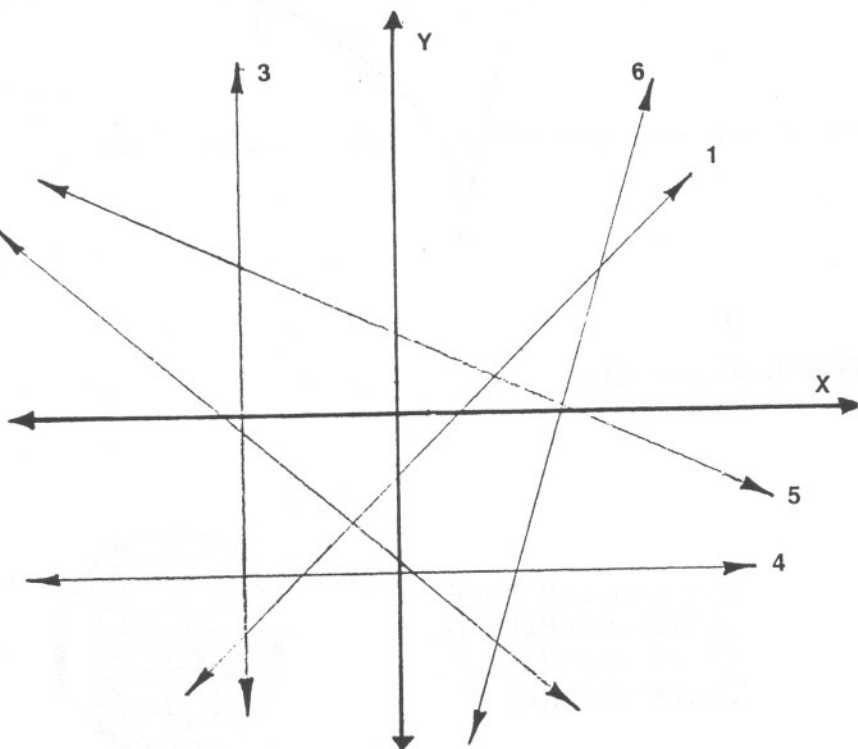


ESTIMATING SLOPES OF LINES

To estimate the slope of a line, select any two points on the line and draw a triangle with horizontal and vertical sides as shown below. The slope of a line is defined as $\frac{\text{change in vertical}}{\text{change in horizontal}}$. This means that you must estimate the ratio of the horizontal and vertical sides of the triangle. For the line shown on the right, the ratio appears to be about $\frac{2}{3}$. Since either 2 or 3 must be negative, the slope is approximately $-\frac{2}{3}$.



Estimate the slope of each of the following lines. (Assume that the scales on the X and Y axes are equal.) You should learn to do this quickly and easily, so that it takes you only a few seconds per line.



- Slope of line 1 _____
- Slope of line 2 _____
- Slope of line 3 _____
- Slope of line 4 _____
- Slope of line 5 _____
- Slope of line 6 _____

Answers are on the bottom of the back side of this sheet.



Answers to opposite side

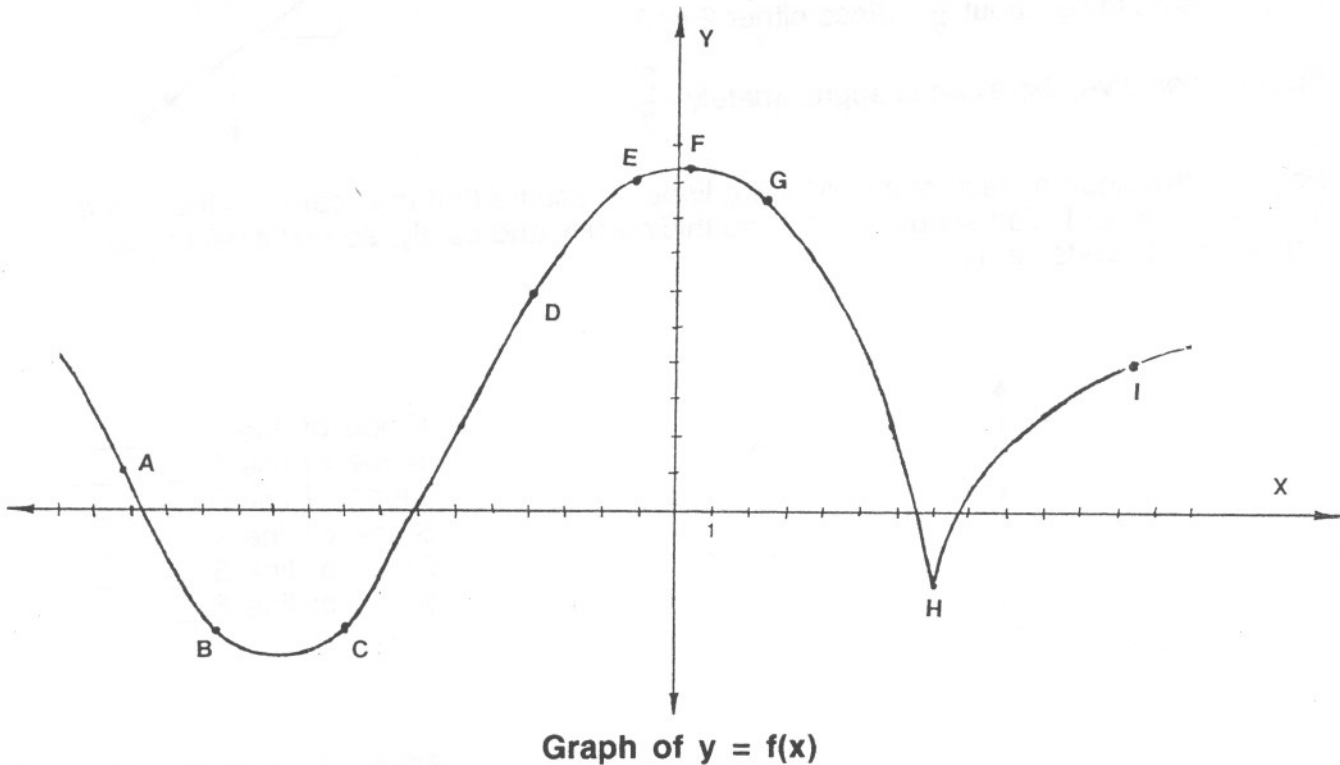
- | | | |
|------------------|-----------------|-----------------|
| A $-\frac{3}{2}$ | D $\frac{3}{2}$ | G -1 |
| B -1 | E $\frac{1}{2}$ | H undefined |
| C 1 | F 0 | I $\frac{2}{5}$ |

$f(x)$ is positive on $[-17, -14.7)$, $(-7.2, 6.5)$, and $(7.6, 14]$

The derivative of $f(x)$ is positive on $(-10.7, 3)$ and $(7, 14)$

ESTIMATING DERIVATIVES

The derivative at any point on the graph of a function is the slope of the line which is tangent to the curve at that point. Use this fact to estimate the derivative at each designated point on the graph of $y = f(x)$, for $-17 \leq x \leq 14$ as shown below. (If you need practice in estimating slopes, begin with the other side of this sheet.)



Derivative of $f(x)$ at A:
 Derivative of $f(x)$ at B:
 Derivative of $f(x)$ at C:
 Derivative of $f(x)$ at D:
 Derivative of $f(x)$ at E:

Derivative of $f(x)$ at F:
 Derivative of $f(x)$ at G:
 Derivative of $f(x)$ at H:
 Derivative of $f(x)$ at I:



Over which intervals is $f(x)$ positive? (Estimate intervals to the nearest tenth.)

Over which intervals is the derivative of $f(x)$ positive? (Estimate intervals to the nearest tenth.)

Answers are on the bottom of the back side of this sheet.

Answers to opposite side

- | | |
|--------------|---------|
| 1. 1 | 4. 0 |
| 2. -1 | 5. -1/2 |
| 3. undefined | 6. 3 |