

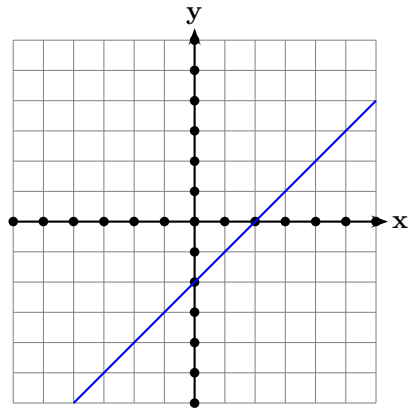
## Eighth Set of Homework for Math 05

Nikos Apostolakis

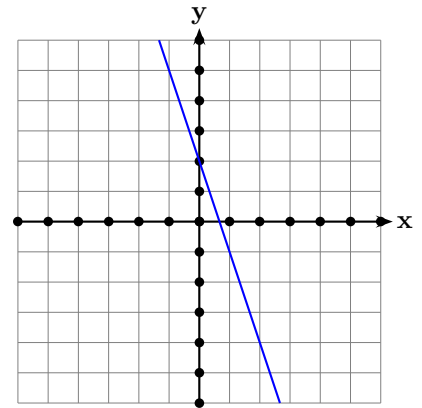
**Please note:** You should fully justify your answers.

### 1 Slope

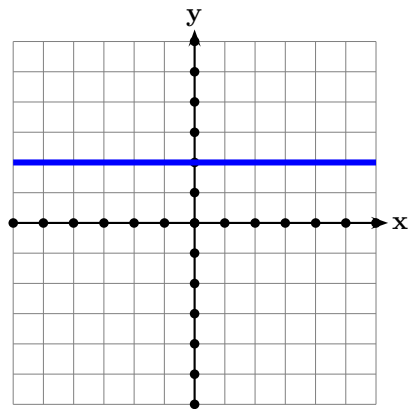
- Find the slope of the following pair of points:
  - $P(2, 3), Q(4, 5)$
  - $M(-2, -2), N(3, -5)$
  - $P(0, -3), Q(3, 5)$
  - $M(-2, 4), N(8, -6)$
  - $S(0, 5), P(3, 0)$
  - $P(-1, -4), Q(-3, -10)$
  - $O(0, 0), P(-1, 4)$
  - $S(2, -3), T(-4, -3)$
  - $P(-1, 4), Q(1, -4)$
  - $A(2, -5), Q(2, 1)$
  - $A\left(\frac{2}{3}, 1\right), B\left(\frac{5}{3}, -\frac{1}{2}\right)$
- For each set of points decide if they are *collinear*, that is whether they lie on the same line.
  - $A(2, 4), B(-3, -6), C(5, 10)$
  - $P(2, 4), Q(4, 10), R(-1, 5)$
  - $O(0, 0), M(-2, -8), N(5, 15)$
  - $M(2, 2), N(3, 3), L(-5, -5)$
  - $P(3, 4), Q(-2, 4), R(-5, 3)$
  - $A(1, 2), B(3, 4), C(5, 7)$
  - $M(-2, -3), N(1, -3), L(7, -3)$
  - $P(11, 4), Q(11, -7), R(11, 8)$
- For each of the following equations find the slope of the line they represent by finding two points in the line and using the formula.
  - $y = 3x - 2$
  - $-2x + 4y = -6$
  - $x = -5y - 7$
  - $3x - 2y = 6$
  - $3(y - 2) = -5(2x - 1) + 3$
- Find the slope for each of the lines in Figure 1.
- Put each of the following equations into slope-intercept form. What is the slope and what is the  $y$ -intercept of the line each equation represents?
  - $x = -2y - 6$



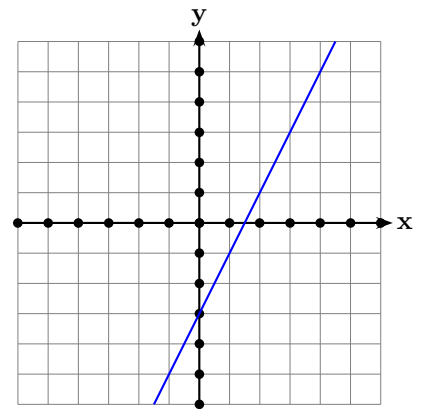
(a)



(b)



(c)



(d)

Figure 1: The lines of Question 4

(b)  $-10x - 5y = 7$

(c)  $-4x + 2y - 10 = 0$

(d)  $3x - 15y - 5 = 0$

(e)  $3y = -8$

(f)  $-7x + 28y - 15 = 0$

(g)  $-2(5x - 5) = 3(4y - 2) + 8$

6. A linear equation is in *general form* if it is written as:

$$Ax + By + C = 0 \tag{1}$$

where  $A$ ,  $B$ ,  $C$  are real numbers and at least one of the  $A$ ,  $B$  is not zero. Find a formula for the slope and the  $y$ -intercept of the line with equation (1), when they exist.