

**Tutorials for end of Week 1 / beginning of Week 2**

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MATH1111: Introduction to Calculus

Semester 1, 2011

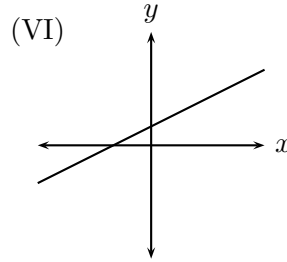
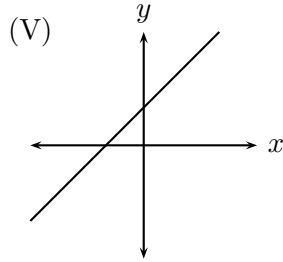
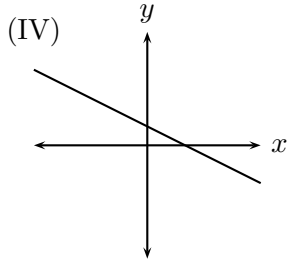
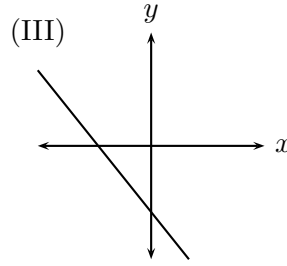
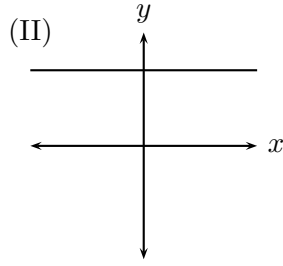
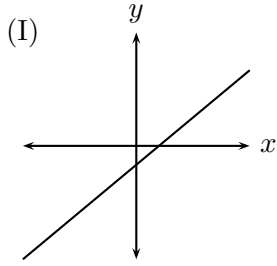
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Web Page: <http://www.maths.usyd.edu.au/u/UG/JM/MATH1111/>

Lecturer: Clio Cresswell

1. The population  $P$  of a large city is a function of time  $t$ , so  $P = f(t)$ .  $P$  is measured in millions, and  $t$  is measured from the year 1900. Explain (in words):
  - (a) The meaning of the statement  $f(70) = 6$ ,
  - (b) What the solution for  $t$  in the expression  $f(t) = 5$  represents,
  - (c) What the solution for  $P$  in the expression  $f(30) = P$  represents.
  
2. Find the equation of the straight line passing through the points
  - (a)  $(0, 0)$  and  $(1, 1)$ ,
  - (b)  $(0, 2)$  and  $(2, 3)$ ,
  - (c)  $(-2, 1)$  and  $(4, 3)$ ,
  - (d)  $(2, 3)$  and  $(2, -6)$ .
  
3. For each of the following lines, determine its slope and  $y$ -intercept:
  - (a)  $6x + y = 4$
  - (b)  $-4x + 3y - 2 = 0$
  - (c)  $9x + 5y = -1$
  - (d)  $2x - 3y = 5$
  
4. The graph of Fahrenheit temperature,  $^{\circ}F$ , as a function of Celsius temperature,  $^{\circ}C$ , is a straight line. Water boils at  $212^{\circ}F$  and  $100^{\circ}C$ , and water freezes at  $32^{\circ}F$  and  $0^{\circ}C$ .
  - (a) What is the slope of the line?
  - (b) What is the equation of the line?
  - (c) What is  $20^{\circ}C$  in  $^{\circ}F$ ?
  - (d) What temperature is the same number of degrees in both  $^{\circ}C$  and  $^{\circ}F$ ?

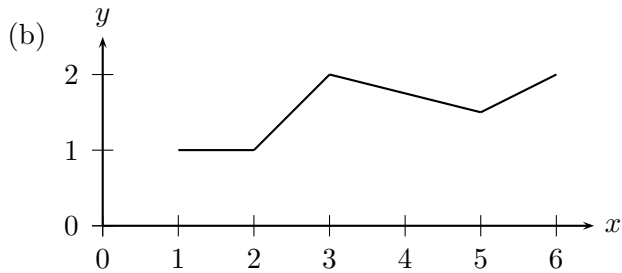
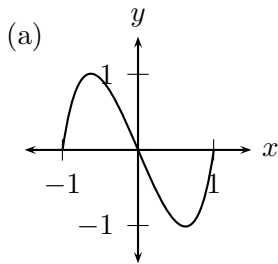
5. Match the graphs below (scales may be unequal):



with the following equations:

- (a)  $2y = 1$
- (b)  $1 - y = x$
- (c)  $2y - x + 2 = 0$
- (d)  $2y - 2x - 4 = 0$
- (e)  $3y = x + 6$
- (f)  $x + y + 2 = 0$

6. Give an approximate domain and range for the following functions:



7. Find the domain and range for the following functions:

- (a)  $y = x^2 + 3$ ,
- (b)  $y = x^3 - 1$ ,
- (c)  $y = \sqrt{x - 1}$ ,
- (d)  $y = \frac{1}{x^2 + 2}$ ,
- (e)  $y = \frac{1}{x^2 - 4}$ ,
- (f)  $f(t) = \sqrt{t^2 - 16}$ .