

All questions should be submitted by 2pm on Thursday 17 January. Assignments can be submitted at your tutorial or to the MATH1040 assignment box (3<sup>rd</sup> floor, Priestley Building). **Make sure that your name, student number and assignment number are on each sheet of your answers.** Write your answers on a separate sheet of paper. You do not need a cover sheet nor do you need to include this question sheet. Solutions will be distributed in class later.

1. Solve and sketch the following quadratic equations:
  - a)  $y = 2x^2 + 2x - 24$
  - b)  $y = 3x^2 + 11x + 12$
  - c)  $10 + 3x^2 - 6x = 7$
  
2. If \$400 is invested for 5 years at a rate of 5.0% per annum, find the final balance if interest compounds:
  - i. annually?
  - ii. every six months?
  - iii. quarterly?
  - iv. monthly?
  - v. continuously?
  
3. Without using a calculator, find each of:
  - i.  $\log_{16} 16^{18}$
  - ii.  $\log_3 27$
  - iii.  $\log_3 \frac{1}{9}$
  - iv.  $\log_{10} 1000$
  - v.  $\log_{10} \frac{1}{10000}$
  - vi.  $\ln e^{12}$
  - vii.  $\ln \frac{1}{e^{18}}$
  
4. A builder rests his 4-metre ladder up against a wall at an angle of  $60^\circ$  to the ground.
  - a) How far up the wall does his ladder reach?
  - b) How far from the base of the wall is the ladder?
  - c) The builder needs his ladder to reach a height of 3.9m. If the ladder is placed at an angle of  $70^\circ$  to the ground, will his ladder reach?

*continued over .....*

5.

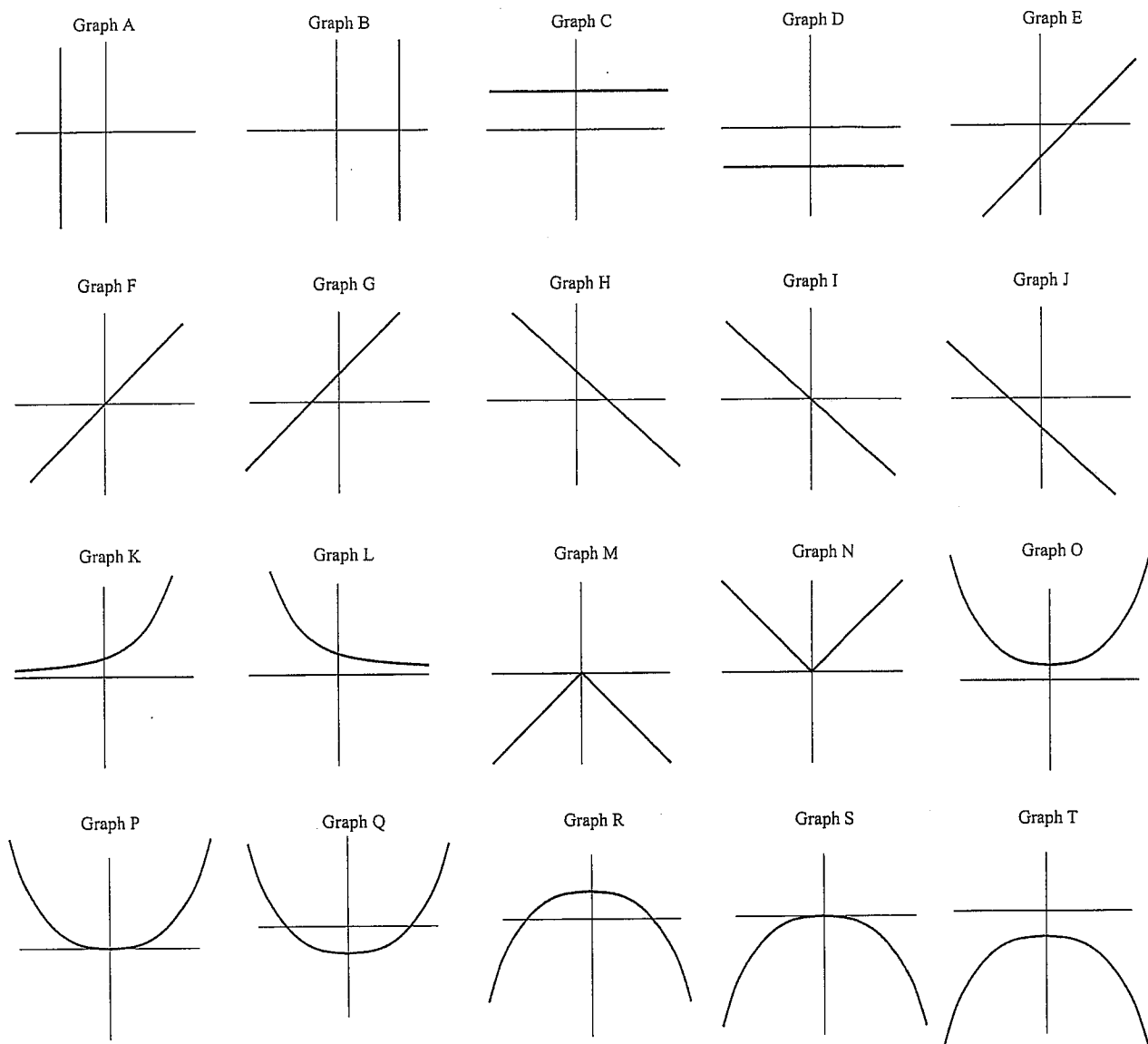


Figure 1: Graphs of various equations.

(1) There are eight equations given in this question and you need to match each equation with its corresponding graph. The graphs are shown in Figure 1.

- i.  $0 = -11x + 6$
- ii.  $2y + 8x^2 - 15 = -y + 13x^2 - 16$
- iii.  $y = e^{5x}$
- iv.  $-10y - x + 2 = 16y + 14$
- v.  $-x + 3 = 8y - 11x + 16$
- vi.  $-10y + 10 = 14y + 6x^2 + 10$
- vii.  $-12y - 9x^2 + 8 = -9y + 7x^2 - 1$
- viii.  $-12x - 5 = 2$

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