1. **(T1.5, R, Cl)** Write these equations in log form, *(Oxford, 4.4 p.115)* 

i.  $x = 2^9$  ii.  $x = 3^5$  iii.  $x = 10^4$  iv.  $x = a^b$ 

- 2. **(T1.9, E, Cl)** The word 'binomial' refers to a mathematical expression with two terms in it. x + 3, and  $y \frac{1}{x}$ , are both examples of binomials. The term 'binomial expansion' refers to a binomial expression raised to a power.  $(x + 3)^2$  is one such example. When the operation is performed  $(x + 3)^2$  becomes  $x^2 + 6x + 9$ . This is referred to as the binomial expansion of  $(x + 3)^2$ . *(Oxford, 6.9 p.184)* 
  - a. Write the binomial expansion of  $(x + y)^2$ .
  - b. Write the binomial expansion of  $(x + y)^3$ .
  - c. Write the binomial expansion of  $(x + y)^4$ .
  - d. Using the pattern, write the binomial expansion of  $(x + y)^7$ .
- 3. **(T3.2, R, CA)** Amina and Salma are standing 40 meters apart on opposite sides of a flag pole. From Amina's position the angle of elevation to the top of the pole is 34°. From Salma's position the angle of elevation to the top of the pole is 52°. How tall is the flagpole? *(Oxford, 11.4 p.380)*
- 4. **(T4.2, E, CA)** Zeina's test scores in chemistry last year were as follows: 81, 84, 81, 79, 80, 76, 90, 87, 84, 86. *(Oxford, 8.4 p.267)* 
  - a. Find the,

i. range ii. median iii. Lower quartile

iv. Upper quartile v. interquartile range (IQR)

- b. Draw a box and whisker plot representing this data.
- 5. **(T1.5, R, Cl)** Solve these equations, *(Oxford, 4.5 p.118)*

i.  $log_4 x = 3$  ii.  $log_3 x = 4$  iii.  $log_x 64 = 2$  iv.  $log_x 6 = \frac{1}{2}$  v.  $log_2 x = -5$ 

- 6. **(T2.5, R, Cl)** If f(x) = x 5 and  $g(x) = x^2 + 1$ , *(Oxford, 1.4 p.14)* 
  - a. Find  $(f \circ g)(x)$
  - b. Find  $(g \circ f)(x)$
  - c. Hence solve the equation  $(f \circ g)(x) = (g \circ f)(x)$
- 7. **(T2.9, R, CA)** The population, P(t), in thousands, of a city is modeled by the function  $P(t) = 30e^{0.04t}$  where t is the number of years after 2000. *(Oxford, 4.8 p.131)* 
  - a. What was the population of the city in the year 2000?
  - b. By what percentage will the city's population increase each year?
  - c. What was the population of the city in 2010?
  - d. In what year did the city population reach 60,000?