



Sample 1

## Question 1 (9 marks - 1 mark each)

a) Simplify each of the following:

i)  $(x + 2)(x + 1)$

ii)  $(x + 1)(x - 3)$

iii)  $(x - 3)(x - 2)$

b) Factorise each of the following:

i)  $x^2 + 3x + 2$

ii)  $x^2 + 3x - 10$

iii)  $x^2 - 5x + 6$

c) Solve each of the following quadratics:

i)  $x^2 + 5x + 6 = 0$

ii)  $x^2 - 2x - 15 = 0$

iii)  $x^2 - 10x + 1 = 0$

## Question 2 (9 marks)

a) Solve each of the following quadratics:

i)  $2(x - 1) = 6$

ii)  $4(3x + 1) = 28$

iii)  $\frac{x}{2} + \frac{x}{3} = 2$  (1 each)

b) Solve each of the following quadratics:

i)  $x^2 + 4x + 4 = 0$

ii)  $x^2 + 3x + 2 = 0$

iii)  $x^2 - 5x - 1 = 0$  (2 each)

## Question 3 (10 marks - 1 mark each)

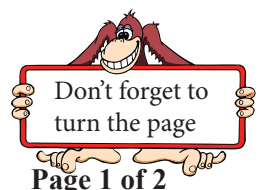
a) A bag contains 2 red balls and a white ball. A ball is withdrawn, the colour noted, and replaced back in the bag. A second ball is then drawn. Find the probability of drawing:

i) 2 white balls one after the other

ii) A red and then a white

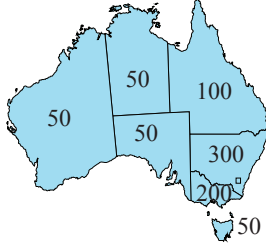
iii) A white and then a red

iv) 2 whites or 2 reds.



### Question 3 Continued

- b) The hospital data showed that of the 80 patients, 27 patients had the A antigen, 19 had the B antigen. 9 patients had both the A and B antigens.  
Find the probability that:
- a patient had the B antigen only
  - a patient had no antigen (ie., neither the A nor B antigen)
  - a patient had no A antigen given that the patient had B Antigen.



Population of Australian States	
NSW	7 200 000
Vic	5 600 000
Qld	4 500 000
WA	2 300 000
SA	1 600 000
Tas	500 000
ACT	400 000
NT	200 000

- c) **10A** An opinion poll reports that public support for the National Broadband Network is 53% and opposition/don't know is 47%. The opinion poll used the above stratified sample.
- Comment on the appropriateness of the stratified sample.
  - The opinion poll was conducted via landline telephones (ie no mobile phones). Comment on the following possible sample bias:
    - Non-response bias: Some people can't or won't answer. Are those who don't answer likely to have different views to those who do answer?
    - Coverage bias: Are people with mobile phones likely to have different views to people with landline telephones?

### Question 4 (10 marks)

- a) **10A** Find the value of each polynomial for the given value of the variable:
- $P(x) = 3x^2 + x + 2$ ,  $P(1)$
  - $P(x) = x^2 + 2x - 1$ ,  $P(-2)$  (1,1)
- b) **10A** Simplify each of the following polynomials:
- $(x^2 + 4x + 5) + (2x^2 - 2x - 1)$
  - $(-x^2 - x + 4) - (-3x^2 + 2x + 2)$
  - $(x + 3)(2x^2 + 2x - 1)$
  - $(x^2 - 5x + 6) \div (x - 3)$  { $x - 3$  is a factor of  $x^2 - 5x + 6$  thus no remainder} (1 each)
- c) **10A** Solve the following polynomial equation:  $x^3 + 5x^2 + 2x - 8 = 0$  (3)
- d) **10A** Find the remainder when  $5x^3 - 2x^2 + 3x - 2$  is divided by  $x + 1$  (1)

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Did you find your silly mistakes?





Sample 2

## Question 1 (9 marks - 1 mark each)

a) Simplify each of the following:

i)  $(x + 1)(x + 2)$

ii)  $(x + 2)(x - 1)$

iii)  $(x - 3)(x - 4)$

b) Factorise each of the following:

i)  $x^2 + 5x + 6$

ii)  $x^2 + 2x - 8$

iii)  $x^2 - 4x - 12$

c) Solve each of the following quadratics:

i)  $x^2 + 2x + 1 = 0$

ii)  $x^2 - 5x + 4 = 0$

iii)  $x^2 - x - 12 = 0$

## Question 2 (9 marks)

a) Solve each of the following quadratics:

i)  $2(x - 1) = 10$

ii)  $7x - 7 = 2x + 3$

iii)  $\frac{3x-1}{4} = 5$  (1 each)

b) Solve each of the following quadratics:

i)  $x^2 + 6x + 9 = 0$

ii)  $x^2 + 6x + 5 = 0$

iii)  $x^2 - 13x + 12 = 0$  (2 each)

## Question 3 (10 marks - 1 mark each)

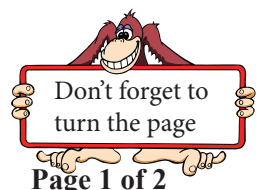
a) A bag contains 2 white balls and a red ball. A ball is withdrawn, the colour noted, and replaced back in the bag. A second ball is then drawn. Find the probability of drawing:

i) 2 white balls one after the other

ii) 2 red balls one after the other

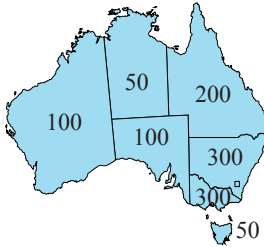
iii) a red and then a white

iv) at least 1 red ball.



### Question 3 Continued

- b) The hospital data showed that of the 45 patients, 21 patients had the A antigen, 16 had the B antigen. 8 patients had both the A and B antigens.  
Find the probability that:
- a patient had the B antigen only
  - a patient had no antigen (ie., neither the A nor B antigen)
  - a patient had no A antigen given that the patient had B Antigen.



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- $(x^2 + 2x + 6) + (3x^2 - 5x - 1)$
  - $(-2x^2 - x + 1) - (-x^2 + 2x + 3)$
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  - $(x^2 + 2x - 8) \div (x - 2)$  { $x - 2$  is a factor of  $x^2 + 2x - 8$  thus no remainder} (1 each)
- c) **10A** Solve the following polynomial equation:  $x^3 + 2x^2 - x - 2 = 0$  (3)
- d) **10A** Find the remainder when  $3x^3 - 2x^2 + x - 2$  is divided by  $x + 2$  (1)

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Did you find your silly mistakes?

