1 (a) Factorise $x^2 - x - 42$

$(x+6)(x-7)$

2

$(x+6)(x-7)$

(2)

(Total for Question 1 is 2 marks)

2 (b) Factorise fully $16m^3g^3 + 24m^2g^5$

$8(2m^3g^3 + 3m^2g^5)$ – factorise integers

$= 8m^2(2mg^3 + 3g^5)$ (1) – factorise m terms

$= 8m^2g^3(2m + 3g^2)$ (1) – factorise g terms

$8m^2g^3(2m + 3g^2)$

(2)

(c) (i) Factorise $y^2 - 2y - 48$

$$y = \frac{2 \pm \sqrt{(-2)^2 - 4(-48)}}{2}$$

$$= \frac{2 \pm 14}{2}$$

$y = 8$ or -6 (1). Hence, $(y + 6)(y - 8)$ (1)

$(y + 6)(y - 8)$

(2)

(ii) Hence, solve $y^2 - 2y - 48 = 0$

$8, -6$ (1)

(1)

(Total for Question 2 is 5 marks)

3 (b) Factorise fully $9ef - 12f$

$9ef - 12f$

$f(9e - 12)$

$3f(3e - 4)$

$3f(3e - 4)$ (2)

(2)

(Total for Question 3 is 2 marks)

4 (b) Factorise fully $5y + 20y^2$

$5y + 20y^2$

$5(y + 4y^2)$

$= 5y(1 + 4y)$ (2)

$5y(1+4y)$

(2)

(Total for Question 4 is 2 marks)

5 (a) Factorise fully $25a^4c^7d + 45a^9c^3h$

(2) $5a^4c^3(5c^4d + 9a^5h)$

(2)

(Total for Question 5 is 2 marks)

6 (i) Factorise $x^2 + 2x - 24$

$(x-4)(x+6)$

$(x-4)(x+6)$ (2)

(2)

(ii) Hence solve $x^2 + 2x - 24 = 0$

$x = 4, -6$ (1)

(1)

(Total for Question 6 is 3 marks)

7 (c) Factorise $x^2 - 11x + 24$

$x = \frac{11 \pm \sqrt{(-11)^2 - 4(1)(24)}}{2}$ (1)

$= \frac{11 \pm \sqrt{25}}{2}$

$= \frac{11+5}{2}$ or $\frac{11-5}{2}$

$= 8$ or 3

$= (x-8)(x-3)$ (1)

$(x-8)(x-3)$

(2)

(Total for Question 7 is 2 marks)

8 (b) Factorise fully $8p^2 - 2p$

$2p(4p-1)$ (2)

$2p(4p-1)$

(2)

(Total for Question 8 is 2 marks)

9 (a) Factorise fully $15y^4 + 20uy^3$

$15y^4 + 20uy^3$

$5y^3(3y + 4u)$ (2)

$5y^3(3y + 4u)$

(2)

(Total for Question 9 is 2 marks)

10 (b) (i) Factorise $x^2 + 5x - 36$

$x^2 + 5x - 36$

$(x + 9)(x - 4)$ (2)

$(x + 9)(x - 4)$

(2)

(ii) Hence, solve $x^2 + 5x - 36 = 0$

$(x + 9)(x - 4) = 0$

$x + 9 = 0$ or $x - 4 = 0$

$x = -9$ $x = 4$

$4, -9$ (1)

(1)

(Total for Question 10 is 3 marks)

11 (b) (i) Factorise $x^2 + 8x - 9$

$x^2 + 8x - 9$

$(x - 1)(x + 9)$

2

$(x - 1)(x + 9)$

(2)

(ii) Hence, solve $x^2 + 8x - 9 = 0$

$(x - 1)(x + 9)$

$x = 1$ or $x = -9$

1

$1, -9$

(1)

(Total for Question 11 is 3 marks)

12 (d) Factorise fully $10c^3d^2 + 15cd^4$

$5(2c^3d^2 + 3cd^4)$

$= 5c(2c^2d^2 + 3d^4)$ (1)

$= 5cd^2(2c^2 + 3d^2)$ (1)

$5cd^2(2c^2 + 3d^2)$

(2)

(Total for Question 12 is 2 marks)

13 (a) Factorise $9x^2 - 4y^2$

$(3x)^2 - (2y)^2$ (1)

$\therefore (3x + 2y)(3x - 2y)$ (1)

$(3x+2y)(3x-2y)$

(2)

(Total for Question 13 is 2 marks)

14 (i) Factorise $x^2 + 5x - 24$

$(x-3)(x+8)$ (2)

$(x-3)(x+8)$

.....

(2)

(ii) Hence, solve $x^2 + 5x - 24 = 0$

$3, -8$ (1)

.....

(1)

(Total for Question 14 is 3 marks)

15 (c) Factorise $n^2 - 7n + 12$

$(n - 3)(n-4)$ 2

$(n-3)(n-4)$

(2)

(Total for Question 15 is 2 marks)

16 (b) (i) Factorise $y^2 - 2y - 35$

$(y-7)(y+5)$ (2)

$(y-7)(y+5)$

(2)

(ii) Hence, solve $y^2 - 2y - 35 = 0$

$7, -5$ (1)

(1)

(Total for Question 16 is 3 marks)

17 (b) Factorise fully $15b^5c - 35b^3c^9$

$5(3b^5c - 7b^3c^9)$

$5b^3(3b^2c - 7c^9)$

$5b^3c(3b^2 - 7c^8)$

(2)

$5b^3c(3b^2 - 7c^8)$

(2)

(Total for Question 17 is 2 marks)

18 (a) Factorise fully $18c^3d^2 - 21c^2$

$3(6c^3d^2 - 7c^2)$

$3c^2(6cd^2 - 7)$

$3c^2(6cd^2 - 7)$ (2)

(2)

(b) (i) Factorise $y^2 - 3y - 18$

$(y - 6)(y + 3)$

(2)

$(y-6)(y+3)$

(2)

(ii) Hence, solve $y^2 - 3y - 18 = 0$

$6, -3$ (1)

(1)

(Total for Question 18 is 5 marks)

19 (a) Factorise $y^2 - 2y - 48$

$(y+6)(y-8)$

2

$(y+6)(y-8)$

(2)

(Total for Question 19 is 2 marks)

20 (c) Factorise fully $14x^2y^4 + 21x^3y^2$

$7(2x^2y^4 + 3x^3y^2)$

$7x^2(2y^4 + 3xy^2)$ (1)

$7x^2y^2(2y^2 + 3x)$ (1)

$7x^2y^2(2y^2 + 3x)$

(2)

(Total for Question 20 is 2 marks)

21 (b) Factorise $y^2 - 9y + 20$

(2)
$(y-5)(y-4)$

(2)

(Total for Question 21 is 2 marks)

22 (c) Factorise fully $16a^2b^3 + 20a^3b$

$4(4a^2b^3 + 5a^3b)$

$4a^2(4b^3 + 5ab)$

$4a^2b(4b^2 + 5a)$ (2)

$4a^2b(4b^2+5a)$

(2)

(d) (i) Factorise $x^2 + 9x - 22$

$(x \pm 11)(x \pm 2)$ (1)

$= (x+11)(x-2)$ (1)

$(x+11)(x-2)$

(2)

(ii) Hence solve $x^2 + 9x - 22 = 0$

$-11, 2$ (1)

(1)

(Total for Question 22 is 5 marks)

23 Factorise fully $50g^2 - 18$

$2(25g^2 - 9)$

$2(5g - 3)(5g + 3)$ (3)

$2(5g - 3)(5g + 3)$

(Total for Question 23 is 3 marks)