Name: _____

IGCSE (9-1) Maths
topics new to Foundation tier:
Algebraic manipulation and indices

Date:

Time: 90 minutes

Total marks available: 81

Total marks achieved: _____

Q1. Make h the subject of the formula $x = 5h + 8$

h = ...

(Total 2 marks)

Q2. Make h the subject of the formula $G = 3h - 5$

h = ...

(Total 2 marks)

Q3. Make h the subject of the formula $t = \frac{gh}{10}$

h = ...

(Total 2 marks)

Q4. Make h the subject of the formula $A = 2\pi r(r + h)$

h = ...

(Total 2 marks)

Q5. Make r the subject of the formula $A = 4\pi r^2$ where r is positive.

r = ...

(Total 2 marks)

Q6. Make r the subject of the formula $V = \pi r^2 h$ where r is positive.

r = ...

(Total 2 marks)

Q7. Make b the subject of $P = \frac{1}{2}ab^2 + c$ where b is positive.

b = ...

(Total 3 marks)

Q8. Rearrange the formula $y = a - bx^2$ to make x the subject.

(Total 3 marks)

Q9. Factorise completely $6y^2 - 9xy$

(Total 2 marks)

Q10. Factorise fully $2x^2 - 4x$

(Total 2 marks)

Q11. Factorise fully $9x^2 - 6xy$

(Total 2 marks)

Q12. Factorise completely $3a^2b + 6ab^2$

(Total 2 marks)

Q13. Factorise completely $12x^3y - 18xy^2$

(Total 2 marks)

Q14. Factorise fully $18ab + 27ab^2$

(Total 2 marks)

Q15. Factorise fully $20e^5f^2 - 16e^2f$

(Total 2 marks)

Q16. Factorise completely $8x^3y^5 - 12x^4y^2$

(Total 2 marks)

Q17. Factorise $e^2 - 2e - 24$

(Total 2 marks)

Q18. Factorise $y^2 - 2y - 48$

(Total 2 marks)

Q19.

(*a*) Factorise $x^2 + x - 30$

(2)

(*b*) Make *b* the subject of $P = \frac{1}{2}ab^2$

b = ...

(2)

(Total 4 marks)

Q20. Factorise $x^2 - 16$

(Total 1 mark)

Q21. Factorise $x^2 - 49$

(Total 1 mark)

Q22.

(*a*) Factorise $a^2 - 144$

(2)

(*b*) Make *q* the subject of the formula $p = \sqrt{q} - 5r$

q = ...

(2)

(Total 4 marks)

Q23.

(*a*) (i) Factorise $x^2 - 12x + 27$

(ii) Solve the equation $x^2 - 12x + 27 = 0$

(3)

(*b*) Factorise $y^2 - 100$

(1)

(Total 4 marks)

Q24.

(*a*) Factorise fully $18e^3f + 45e^2f^4$

(2)

(*b*) Solve $x^2 - 4x - 12 = 0$
Show clear algebraic working.

(3)

(Total 5 marks)

Q25. Solve $x^2 + 2x - 35 = 0$

(Total 3 marks)

Q26. Solve $x^2 + 2x - 15 = 0$

(Total 3 marks)

Q27.

(*a*) Factorise fully $6ab + 10ac$

(2)

(*b*) Factorise $y^2 - 16$

(1)

(*c*) Simplify $(h^2)^{-3}$

(1)

(Total 4 marks)

Q28. Write down the value of

(i) 7°

(ii) 5^{-1}

(Total 2 marks)

Q29. Write these numbers in order of size.
Start with the smallest number.

5^{-1} 0.5 -5 5^0

(Total 2 marks)

Q30.

(*a*) Simplify $\left(m^4\right)^{-3}$

(1)

(*b*) Write down the value of c^0

(1)

(Total 2 marks)

Q31.

(*a*) Simplify m^0

(1)

(*b*) Simplify $(2x^6y^{-1})^3$

(2)

(Total 3 marks)

Q32.

(*a*) Simplify $(m^{-2})^5$

(1)

(*b*) Factorise $x^2 + 3x - 10$

(2)

(Total 3 marks)

Q33. Simplify $\left(x^{-y}\right)^{-z}$

(Total 1 mark)

Q34. $t^n = \frac{1}{t^3}$

Write down the value of n.

n = ...

(Total 1 mark)