TB(2A) Ch. 2 Identities and Factorization
Conventional Questions

1. [11-12 F.2 S.Test 1 #1]

Prove that $(2x+1)^2-(x-2)^2=(3x-1)(x+3)$ is an identity. **(3 marks)**

2. [11-12 F.2 S.Test 1 #2]

It is given that $x^2+5x+B\equiv(x+A)(x+2)$. Find the values of *A* and *B*. **(3 marks)**

3. [11-12 F.2 S.Test 1 #3]

Factorize $r+6k-6-kr$. **(3 marks)**

4. [11-12 F.2 S.Test 1 #4]

(a) Factorize $4x^2-20xy+25y^2$. **(2 marks)**

(b) Hence, factorize $625y^2-4x^2+20xy-25y^2$. **(4 marks)**

5. [11-12 F.2 S.Test 1 #5]

Expand $\left(\frac{2}{3}-\frac{w^2}{4}\right)\left(-\frac{w^2}{4}-\frac{2}{3}\right)$ by using the identity of the difference of two squares.

(2 marks)

6. [11-12 F.2 Mid-year Exam #2]

It is given that $Ax(x-5)+3(Bx-C)\equiv 2x^2-x+A-C$, where *A*, *B* and *C* are constants. Find the values of *A*, *B* and *C*. **(4 marks)**

7. [11-12 F.2 Mid-year Exam #4]

Expand the following expressions by using the identities of the perfect square or the identity of the difference of two squares.

(a) $-4(3m-1)(1-3m)$ **(3 marks)**

(b) $\left(-\frac{7a}{b}-\frac{2b}{a}\right)\left(-\frac{2b}{a}+\frac{7a}{b}\right)$ **(2 marks)**

8. [11-12 F.2 Final Exam #8]

(a) Factorize $2x^2y-18x^2y^3$. **(2 marks)**

(b) Hence, or otherwise, factorize $2x^2y-18x^2y^3-12x^2y+4x^2$. **(2 marks)**

9. [12-13 S.Test 1#1]

Determine whether $(x+3)^2=(x+4)(x+2)+1$ is an identity. **(3 marks)**

10. [12-13 S.Test 1#2]

Factorize

(a) $a+b+c-pa-pb-pc$. **(2 marks)**

(b) $4x-7xy-4x^2+7y$. **(2 marks)**

11. [12-13 S.Test 1#3]

(a) Factorize $16x^2+8x+1$. **(1 mark)**

(b) Hence, factorize y^2-16x^2-8x-1. **(3 marks)**

12. [12-13 S.Test 1#5]

Find the values of the constants A, B and C if $A(x-2)^2+Bx^2+C\equiv -x^2+4x+B$. **(4 marks)**

13. [12-13 Mid-year#1]

(a) Expand $\left(2a^2-11\right)\left(11+2a^2\right)$ by using the identity of the difference of two squares. **(1 mark)**

(b) Expand $\left(5a+\frac{1}{2}\right)^2$ by using the identity of the perfect square. **(1 mark)**

14. [12-13 Mid-year#2]

(a) Factorize $(m-n)-k(n-m)$. **(2 marks)**

(b) Factorize $50a^3-18ab^2$. **(2 marks)**

15. [12-13 Mid-year#3]

Determine whether $n+(n-5)^2=n(n-9)+25$ is an identity. **(3 marks)**

16. [12-13 Mid-year#9]

If $(x+2)(x-A)\equiv x(Bx+1)+C$, find the values of *A*, *B* and *C*. **(4 marks)**

17. [12-13 F.6 Mock Exam #3]

Factorize

(a) $ax^2-b+abx-x$, and

(b) $162x^2-2y^2$.

18. [12-13 S.2 Final Exam #10]

(a) Expand $\frac{1}{2}(5x+4)^2$ by using the perfect square identity. **(2 marks)**

(b) Factorize $\left(y^2+2y+1\right)x^2-4\left(y^2-1\right)^2$. **(3 marks)**

19. [12-13 S.2 S.Test #1]

Expand

(a) $2(3x+4)^2$ by using an identity of the prefect square. **(2 marks)**

(b) $\left(\frac{x}{2}-\frac{y}{3}\right)\left(\frac{y}{3}+\frac{x}{2}\right)$ by using the identity of the difference of two squares. **(1 mark)**

20. [12-13 S.2 S.Test #2]

Determine whether $3(3x+5)-2(x-3)=7x+21$ is an identity. **(2 marks)**

21. [12-13 S.2 S.Test #6]

(a) Factorize $36x^2+12x+1$. **(1 mark)**

(b)Factorize $49y^2-28y+4$. **(1 mark)**

(c)Hence, factorize $36x^2+12x-49y^2+28y-3$. **(2 marks)**

22. [12-13 S.2 S.Test #7]

Find the values of A, B and C in the identity $(Ax+1)(x-1)-C\equiv Bx+3$. **(4 marks)**

23. [13-14 S.2 S.Test1 #1]

Expand **(a)** $2(3x+4)^2$ by using an identity of the prefect square. **(2 marks)**

(b) $\left(\frac{x}{2}-\frac{y}{3}\right)\left(\frac{y}{3}+\frac{x}{2}\right)$ by using the identity of the difference of two squares. **(1 mark)**

24. [13-14 S.2 S.Test1 #2]

Determine whether $3(3x+5)-2(x-3)=7x+21$ is an identity. **(2 marks)**

25. [13-14 S.2 S.Test1 #6]

(a) Factorize $36x^2+12x+1$. **(1 mark)**

(b) Factorize $49y^2-28y+4$. **(1 mark)**

(c) Hence, factorize $36x^2+12x-49y^2+28y-3$. **(2 marks)**

26. [13-14 S.2 S.Test1 #6]

Find the values of A, B and C in the identity $(Ax+1)(x-1)-C\equiv Bx+3$. **(4 marks)**

27. [13-14 S.2 Mid-year Exam #1]

Determine whether $\frac{5x-3}{2}-\frac{x+1}{3}=\frac{13x-7}{6}$ is an identity. **(3 marks)**

28. [13-14 S.2 Mid-year Exam #2]

It is given that $(x+2)^2-Ax+12\equiv Bx^2+8x+16$. Find the values of A and B. **(3 marks)**

29. [13-14 S.2 Mid-year Exam #7]

(a) Factorize $x^2 - \frac{1}{4}$. **(1 mark)**

(b) Hence factorize $x^4 - \frac{1}{16}$. **(2 marks)**

30. [13-14 S.2 Mid-year Exam #13]

(a) Factorize $x^2 - 12x + 36$. **(1 mark)**

(b) Expand $(x-3)^2$ by using a perfect square identity. **(1 mark)**

(c) May claims that $2x^2 - 18x + 45$ is always positive for all values of x. Do you agree? Explain your answer. **(2 marks)**

31. [13-14 S.2 Final Exam #7]

(a) Expand $\left(\frac{x}{2} + \frac{y}{3}\right)^2$ using a perfect square identity. **(1 mark)**

(b) Factorise $x^4 - 16 + 16x + 4x^3$. **(3 marks)**

32. [14-15 Mid-year Exam]

It is given that $(2x + A)(x - 3) \equiv Bx^2 - 5x + C$. Find the values of A, B and C. **(4 marks)**

33. [14-15 Mid-year Exam]

(a) Prove that $(a-b)^2 + 4ab = (a+b)^2$ is an identity. **(2 marks)**

(b) Hence, or otherwise, factorize $(x-y)^2 + 4xy - xz - yz$. **(3 marks)**

34. [14-15 Mid-year Exam]

(a) Factorize $9a^2 - 16b^2$. **(1 mark)**

(b) Factorize $9(m-n)^{2014} - 16(n-m)^{2014}$. **(1 mark)**

35. [14-15 S.6 Mock Exam #2]

Factorize

(a) $2x^2 - 11x + 5$,

(b) $2x^2y - 10xy - 2x^2 + 11x - 5$.

(3 marks)

36. [14-15 S.2 Final Exam #1a]

(a) Factorize $8a^2 - 18b^2$. **(2 marks)**

37. [14-15 S.2 Final Exam #10]

It is given that $(x - 2)^2 + Ax \equiv (x + B)(x - 1)$, find the values of A and B. **(3 marks)**

38. [15-16 S.2 Mid-year #1]

Determine whether $(x+7)(x-7)+14x=(x+7)^2-98$ is an identity. **(2 marks)**

39. [15-16 S.2 Mid-year #2]

(a) Factorize $8x^2-50$. **(2 marks)**

(b) Hence, factorize $8x^2-50+2xy-5y$. **(2 marks)**

40. [15-16 S.2 Mid-year Exam #7]

It is given that $(x-4)(x+A)+B\equiv x^2-10x+25$. Find the values of *A* and *B*. **(3 marks)**

41. [15-16 S.2 Mid-year Exam #8]

(a) Factorize $Ax+Cy+Bx+By+Ay+Cx$. **(2 marks)**

(b) Factorize $x^2-y^2-(x-y)^2$. **(2 marks)**

42. [15-16 S.2 Final Exam #1]

It is given that $(2x-1)^2\equiv(x-1)(Ax-1)-Bx$, find the values of *A* and *B*. **(2 marks)**

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