Demo AS Core Questions

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Please answer on file paper.

1: Work out the following:

a) Give the order of $7x^{17} - 3x^8 + 2x^5$

b) Give the order of $-8x^{19} + 5x^4$

2: Work out the following:

a) $(-2x^3 - 7x^2 + x - 1) + (8x^3 - 9x^2 + 5x - 8)$

b) $(4x^3 + 2x^2 + 4) + (-6x^3 + 3x^2 - 3x + 8)$

3: Work out the following:

a) $(x^3 - 6x^2 - 4x + 10) - (6x^3 + 7x^2 + 6x - 2)$

b) $(-x^3 + 9x^2 - 5x - 10) - (-10x^3 - x^2 + x + 2)$

4: Work out the following:

a) $(10x + 3) \times (-4x^3 - 8x^2 - 7x - 6)$

b) $(3x + 5) \times (-5x^3 - 9x^2 + 7x - 4)$

5: Work out the following:

a) $(-9x^2 - 2x + 4) \times (9x^2 + 6x + 10)$

b) $(-7x^2 - 5x - 3) \times (-3x^2 - 10x + 8)$

6: Work out the following:

a) $(15x^3 - 40x^2 + 18x - 48) \div (3x - 8)$

b) $(7x^3 + 23x^2 + 14x - 8) \div (x + 2)$

7: Work out the following:

a) Is $(x + 3)$ a factor of $x^3 - 6x^2 + 11x - 6$?

b) Is $(x + 2)$ a factor of $x^3 + x^2 - 22x - 40$?

8: Work out the following:

a) Factorise $x^3 + 12x^2 + 47x + 60$

b) Factorise $2x^3 - 5x^2 - 28x + 15$

9: Work out the following:

a) Find the remainder when $x^3 + 5x^2 + 2x - 8$ is divided by $(x - 4)$.

b) Find the remainder when $2x^3 - 5x^2 - x + 6$ is divided by $(x + 2)$.

10: Expand and simplify the following:

a) $(1 + f)^4$

b) $(1 + x)^3$

11: Expand and simplify the following:

a) $(1 - 2q)^5$ b) $(1 + 3s)^5$

12: Expand and simplify the following:

a) $(2 - y)^5$ b) $(2 + 3a)^3$

13: Expand and simplify the following:

a) $(1 + h^2)^4$ b) $(1 + w^4)^4$

14: Expand and simplify the following:

a) $(3k + 4v)^4$ b) $(3z - r)^3$

15: Differentiate the following with respect to x:

a) $-10x^5 - x^{10} + 10x^8$ b) $4x^4 - 6x^2 - 5x^9 - 7x^7$

16: Differentiate the following with respect to x:

a) $\frac{3}{x^6} + \frac{1}{x^3} - 2$ b) $\frac{8}{x} - 9x^2 + 9x^{10} + \frac{4}{x^6}$

17: Find the gradient at the given point:

a) $y = 4x^2 + 5x^4 + 5$ at $x = 3$ b) $y = -2x^3 + 3x - x^2$ at $x = -2$

18: Find the co-ordinates and nature of any turning points:

a) $y = x^2 + 16x - 4$ b) $y = -2x^3 - 3x^2 + 36x - 10$

Answers: Demo AS Core Questions

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1:	a) Order 17	b) Order 19
2:	a) $6x^3 - 16x^2 + 6x - 9$	b) $-2x^3 + 5x^2 - 3x + 12$
3:	a) $-5x^3 - 13x^2 - 10x + 12$	b) $9x^3 + 10x^2 - 6x - 12$
4:	a) $-40x^4 - 92x^3 - 94x^2 - 81x - 18$	b) $-15x^4 - 52x^3 - 24x^2 + 23x - 20$
5:	a) $-81x^4 - 72x^3 - 66x^2 + 4x + 40$	b) $21x^4 + 85x^3 + 3x^2 - 10x - 24$
6:	a) $5x^2 + 6$	b) $7x^2 + 9x - 4$
7:	a) No: $f(-3) = -120$	b) Yes: $f(-2) = 0$.
8:	a) $(x + 4)(x + 3)(x + 5)$	b) $(2x - 1)(x + 3)(x - 5)$
9:	a) $f(4) = 144$	b) $f(-2) = -28$
10:	a) $1 + 4f + 6f^2 + 4f^3 + f^4$	b) $1 + 3x + 3x^2 + x^3$
11:	a) $1 - 10q + 40q^2 - 80q^3 + 80q^4 - 32q^5$ b) $1 + 15s + 90s^2 + 270s^3 + 405s^4 + 243s^5$	
12:	a) $32 - 80y + 80y^2 - 40y^3 + 10y^4 - y^5$	b) $8 + 36a + 54a^2 + 27a^3$
13:	a) $1 + 4h^2 + 6h^4 + 4h^6 + h^8$	b) $1 + 4w^4 + 6w^8 + 4w^{12} + w^{16}$
14:	a) $81k^4 + 432k^3v + 864k^2v^2 + 768kv^3 + 256v^4$ b) $27z^3 - 27z^2r + 9zr^2 - r^3$	
15:	a) $-50x^4 - 10x^9 + 80x^7$	b) $16x^3 - 12x - 45x^8 - 49x^6$
16:	a) $-\frac{18}{x^7} - \frac{3}{x^4}$	b) $-\frac{8}{x^2} - 18x + 90x^9 - \frac{24}{x^7}$
17:	a) 564	b) –17
18:	a) (-8, -68) min	b) (2, 34) max; (-3, -91) min