Algebraic Expression - Edexcel Past Exam Questions

1. (a) Write down the value of $16^{\frac{1}{2}}$. **(1)**

   (b) Find the value of $16^{-\frac{3}{2}}$. **(2)**

   Jan 05 Q1

2. (a) Write down the value of $8^{\frac{1}{3}}$. **(1)**

   (b) Find the value of $8^{-\frac{2}{3}}$. **(2)**

   June 05 Q1.

3. (a) Show that $\dfrac{(3-\sqrt{x})^2}{\sqrt{x}}$ can be written as $9x^{-\frac{1}{2}} - 6 + x^{\frac{1}{2}}$. **(2)**

   June 05 Q7

4. Factorise completely

   $$x^3 - 4x^2 + 3x.$$ **(3)**

   Jan 06 Q1

5. (a) Write $\sqrt{45}$ in the form $a\sqrt{5}$, where a is an integer. **(1)**

   (b) Express $\dfrac{2(3+\sqrt{5})}{(3-\sqrt{5})}$ in the form $b + c\sqrt{5}$, where b and c are integers. **(5)**

   Jan 06 Q5

6. (a) Expand and simplify $(4 + \sqrt{3})(4 - \sqrt{3})$. **(2)**

   (b) Express $\dfrac{26}{4+\sqrt{3}}$ in the form $a + b\sqrt{3}$, where a and b are integers. **(2)**

   June 06 Q6

7. Given that $f(x) = (x^2 - 6x)(x - 2) + 3x$,

   (a) express $f(x)$ in the form $x(ax^2 + bx + c)$, where a, b and c are constants. **(3)**

   (b) Hence factorise $f(x)$ completely. **(2)**

   June 06 Q9

8. (*a*) Express $\sqrt{108}$ in the form $a\sqrt{3}$, where a is an integer. **(1)**

(*b*) Express $(2 - \sqrt{3})^2$ in the form $b + c\sqrt{3}$, where b and c are integers to be found. **(3)**

Jan 07 Q2

9. Simplify $(3 + \sqrt{5})(3 - \sqrt{5})$. **(2)**

June 07 Q1

10. (*a*) Find the value of $8^{\frac{4}{3}}$. **(2)**

(*b*) Simplify $\dfrac{15x^{\frac{4}{3}}}{3x}$. **(2)**

June 07 Q2

11. (*a*) Write down the value of $16^{\frac{1}{4}}$. **(1)**

(*b*) Simplify $(16x^{12})^{\frac{3}{4}}$. **(2)**

Jan 08 Q2

12. Simplify

$$\frac{5 - \sqrt{3}}{2 + \sqrt{3}},$$

giving your answer in the form $a + b\sqrt{3}$, where a and b are integers. **(4)**

Jan 08 Q3

13. Factorise completely $x^3 - 9x$. **(3)**

June 08 Q2

14. (*a*) Write down the value of $125^{\frac{1}{3}}$. **(1)**

(*b*) Find the value of $125^{-\frac{2}{3}}$. **(2)**

Jan 09 Q1

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15. Expand and simplify $(\sqrt{7} + 2)(\sqrt{7} - 2)$. **(2)**

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16. Given that $\dfrac{2x^2 - x^{\frac{3}{2}}}{\sqrt{x}}$ can be written in the form $2x^p - x^q$,

(a) write down the value of p and the value of q. **(2)**

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17. Simplify

(a) $(3\sqrt{7})^2$ **(1)**

(b) $(8 + \sqrt{5})(2 - \sqrt{5})$ **(3)**

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18. Given that $32\sqrt{2} = 2^a$, find the value of a. **(3)**

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19. (a) Expand and simplify $(7 + \sqrt{5})(3 - \sqrt{5})$.

(3)

(b) Express $\dfrac{7 + \sqrt{5}}{3 + \sqrt{5}}$ in the form $a + b\sqrt{5}$, where a and b are integers. **(3)**

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20. Write

$$\sqrt{(75)} - \sqrt{(27)}$$

in the form $k\sqrt{x}$, where k and x are integers. **(2)**

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21. (a) Find the value of $16^{-\frac{1}{4}}$. **(2)**

(b) Simplify $x\left(2x^{-\frac{1}{4}}\right)^4$. **(2)**

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22. Simplify

$$\frac{5 - 2\sqrt{3}}{\sqrt{3} - 1},$$

giving your answer in the form $p + q\sqrt{3}$, where p and q are rational numbers. **(4)**

Jan 11 Q3

23. Find the value of

(*a*) $25^{\frac{1}{2}}$, **(1)**

(*b*) $25^{-\frac{3}{2}}$. **(2)**

June 11 Q1

24. Given that $\dfrac{6x + 3x^{\frac{5}{2}}}{\sqrt{x}}$ can be written in the form $6x^p + 3x^q$,

(*a*) write down the value of p and the value of q. **(2)**

June 11 Q6