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**Algebraic Expression - Edexcel Past Exam Questions 2**

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1. (a) Simplify

$$\sqrt{32} + \sqrt{18},$$

giving your answer in the form  $a\sqrt{2}$ , where  $a$  is an integer. (2)

- (b) Simplify

$$\frac{\sqrt{32} + \sqrt{18}}{3 + \sqrt{2}},$$

giving your answer in the form  $b\sqrt{2} + c$ , where  $b$  and  $c$  are integers. (4)

**Jan 12 Q2**

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2. (a) Evaluate
- $(32)^{\frac{3}{5}}$
- , giving your answer as an integer. (2)

- (b) Simplify fully
- $\left(\frac{25x^4}{4}\right)^{-\frac{1}{2}}$
- . (2)

**June 12 Q2**

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3. Show that
- $\frac{2}{\sqrt{12} - \sqrt{8}}$
- can be written in the form
- $\sqrt{a} + \sqrt{b}$
- , where
- $a$
- and
- $b$
- are integers. (5)

**June 12 Q3**

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4. Factorise completely
- $x - 4x^3$
- . (3)

**Jan 13 Q1**

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5. Express
- $8^{2x+3}$
- in the form
- $2^y$
- , stating
- $y$
- in terms of
- $x$
- . (2)

**Jan 13 Q2**

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6. (i) Express

$$(5 - \sqrt{8})(1 + \sqrt{2})$$

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

- (ii) Express

$$\sqrt{80} + \frac{30}{\sqrt{5}}$$

in the form  $c\sqrt{5}$ , where  $c$  is an integer. (3)

**Jan 13 Q3**

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7. Find  $\frac{15}{\sqrt{3}} - \sqrt{27}$  in the form  $k\sqrt{3}$ , where  $k$  is an integer. (4)

June 13(R) Q2

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8. Solve

(a)  $2^y = 8$ , (1)

(b)  $2^x \times 4^{x+1} = 8$ . (4)

June 13(R) Q5

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9. Simplify

$$\frac{7 + \sqrt{5}}{\sqrt{5} - 1},$$

giving your answer in the form  $a + b\sqrt{5}$ , where  $a$  and  $b$  are integers. (4)

June 13 Q1

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10. (a) Find the value of  $8^{\frac{5}{3}}$ . (2)

(b) Simplify fully  $\frac{(2x^2)^3}{4x^2}$ . (3)

June 13 Q3

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11. (a) Write down the value of  $32^{\frac{1}{5}}$ . (1)

(b) Simplify fully  $(32x^5)^{-\frac{2}{5}}$ . (3)

June 14 Q2

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12. (a) Write  $\sqrt{80}$  in the form  $c\sqrt{5}$ , where  $c$  is a positive constant. (1)

A rectangle  $R$  has a length of  $(1 + \sqrt{5})$  cm and an area of  $\sqrt{80}$  cm<sup>2</sup>.

- (b) Calculate the width of  $R$  in cm. Express your answer in the form  $p + q\sqrt{5}$ , where  $p$  and  $q$  are integers to be found. (4)

June 14 Q6

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13. Factorise fully  $25x - 9x^3$ . (3)

June 14(R) Q1

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14. (a) Evaluate  $81^{\frac{3}{2}}$  (2)

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

**June 14(R) Q2**

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15. Solve the equation

$$10 + x\sqrt{8} = \frac{6x}{\sqrt{2}}$$

Give your answer in the form  $a\sqrt{b}$  where  $a$  and  $b$  are integers.

(4)

**June 14(R) Q5**

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16. Simplify

(a)  $(2\sqrt{5})^2$ , (1)

(b)  $\frac{\sqrt{2}}{2\sqrt{5}-3\sqrt{2}}$ , giving your answer in the form  $a + \sqrt{b}$ , where  $a$  and  $b$  are integers. (4)

**June 15 Q1**

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17. Express  $9^{3x+1}$  in the form  $3^y$ , giving  $y$  in the form  $ax + b$ , where  $a$  and  $b$  are constants. (2)

**June 16 Q2**

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18. (a) Simplify

$$\sqrt{50} - \sqrt{18}$$

giving your answer in the form  $a\sqrt{2}$ , where  $a$  is an integer.

(2)

(b) Hence, or otherwise, simplify

$$\frac{12\sqrt{3}}{\sqrt{50} - \sqrt{18}}$$

giving your answer in the form  $b\sqrt{c}$ , where  $b$  and  $c$  are integers and  $b \neq 1$ .

(3)

**June 16 Q3**

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19. (a) Given  $y = 2^x$ , show that

$$2^{2x+1} - 17(2^x) + 8 = 0$$

can be written in the form

$$2y^2 - 17y + 8 = 0 \quad (2)$$

- (b) Hence solve

$$2^{2x+1} - 17(2^x) + 8 = 0 \quad (4)$$

**June 17 Q6**

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