

C1 Surds Questions

Specimen

2. Simplify

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

expressing your answer in the form  $a + \sqrt{b}$ , where  $a$  and  $b$  are integers. [4]

2005 Winter

2. Simplify

$$\frac{6 + \sqrt{7}}{\sqrt{7} - 2}$$

expressing your answer in surd form. [4]

2005 Summer

2. Simplify each of the following, expressing your answers in surd form:

(a)  $\sqrt{45} + \sqrt{80} - \sqrt{125}$ ; [3]

(b)  $\frac{6 + \sqrt{2}}{2 + \sqrt{2}}$ . [4]

2006 Winter

2. (a) Simplify the following.

$$\sqrt{48} + \sqrt{27} - \frac{6}{\sqrt{3}} \quad [4]$$

(b) Simplify  $\frac{2 + \sqrt{7}}{3 + \sqrt{7}}$ , expressing your answer in surd form. [4]

2006 Summer

2. Simplify each of the following, expressing your answers in surd form.

(a)  $\frac{5 - \sqrt{3}}{\sqrt{3} + 1}$ , [4]

(b)  $(2 + \sqrt{3})(4 - \sqrt{12})$ . [4]

2007 Winter

2. Simplify each of the following expressions, expressing your answers in surd form.

(a)  $2\sqrt{32} + 3\sqrt{8} - \sqrt{18}$  [3]

(b)  $\frac{6 + \sqrt{30}}{6 - \sqrt{30}}$  [4]

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2007 Summer

2. Simplify

(a)  $2\sqrt{8} + \sqrt{18} - \frac{12}{\sqrt{2}}$ , [4]

(b)  $\frac{5 + \sqrt{15}}{5 - \sqrt{15}}$ . [4]

2008 Winter

2. Simplify the following.

(a)  $\sqrt{20} + \frac{\sqrt{35}}{\sqrt{7}} - \frac{20}{\sqrt{5}}$  [4]

(b)  $\frac{2 + \sqrt{3}}{5 + 2\sqrt{3}}$  [4]

2008 Summer

2. Simplify

(a)  $\sqrt{75} - \frac{9}{\sqrt{3}} + (\sqrt{6} \times \sqrt{2})$ , [4]

(b)  $\frac{5\sqrt{5} - 2}{4 + \sqrt{5}}$ . [4]

2009 Winter

2. Simplify

(a)  $\frac{10\sqrt{3}-1}{4-\sqrt{3}}$ , [4]

(b)  $(2+\sqrt{5})(5-\sqrt{20})$ . [4]

2009 Summer

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2. Simplify

(a)  $\frac{8-\sqrt{7}}{\sqrt{7}-2}$ , [4]

(b)  $\sqrt{50}+(\sqrt{3}\times\sqrt{6})-\frac{14}{\sqrt{2}}$ . [4]

2010 Winter

2. Simplify

(a)  $\frac{2\sqrt{11}-3}{\sqrt{11}+2}$ , [4]

(b)  $\frac{22}{\sqrt{2}}-\sqrt{50}-(\sqrt{2})^5$ . [4]

2010 Summer

2. Simplify

$$(a) \frac{5\sqrt{7} - \sqrt{3}}{\sqrt{7} - \sqrt{3}}, \quad [4]$$

$$(b) (\sqrt{15} \times \sqrt{20}) - \sqrt{75} - \frac{\sqrt{60}}{\sqrt{5}}. \quad [4]$$

2011 Winter

2. Simplify  $\frac{\sqrt{2}}{10 - 7\sqrt{2}}$ . [4]

2011 Summer

2. Simplify

$$(a) \frac{9}{\sqrt{3}-1} + \frac{7}{\sqrt{3}+1}, \quad [4]$$

$$(b) \frac{90}{\sqrt{3}} - \sqrt{6} \times \sqrt{8} - (2\sqrt{3})^3. \quad [4]$$

2012 Winter

2. Simplify

$$(a) \frac{9 + 4\sqrt{2}}{5 + 3\sqrt{2}}, \quad [4]$$

$$(b) (\sqrt{8} \times \sqrt{10}) + \frac{\sqrt{90}}{\sqrt{2}} - \frac{30}{\sqrt{5}}. \quad [4]$$

2012 Summer

2. Simplify

$$(a) \frac{10}{7 + 2\sqrt{11}}, \quad [3]$$

$$(b) (4\sqrt{3})^2 - (\sqrt{8} \times \sqrt{50}) - \frac{5\sqrt{63}}{\sqrt{7}}. \quad [4]$$

2013 Winter

2. Simplify

(a)  $\frac{6\sqrt{7} - 11\sqrt{2}}{\sqrt{7} - \sqrt{2}}$ , [4]

(b)  $\frac{3}{2\sqrt{6}} + \left(\frac{\sqrt{6}}{2}\right)^3$ . [3]

2013 Summer

2. Simplify

(a)  $\frac{2 + 5\sqrt{7}}{4 + \sqrt{7}}$ , [4]

(b)  $\sqrt{360} - \sqrt{2} \times (\sqrt{5})^3 - \frac{\sqrt{30} \times \sqrt{8}}{\sqrt{6}}$ . [4]

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2014 Winter

2. Simplify  $\frac{3\sqrt{3} - 2\sqrt{5}}{2\sqrt{3} + \sqrt{5}}$ . [4]

2014 Summer

2. Simplify

(a)  $\frac{3\sqrt{3} + 1}{5\sqrt{3} - 7}$ , [4]

(b)  $(\sqrt{12} \times \sqrt{24}) + \frac{\sqrt{150}}{\sqrt{3}} - \frac{36}{\sqrt{2}}$ . [4]

2015

2. Simplify

(a)  $\frac{4\sqrt{2} - \sqrt{11}}{3\sqrt{2} + \sqrt{11}}$ , [4]

(b)  $\frac{7}{2\sqrt{14}} + \left(\frac{\sqrt{14}}{2}\right)^3$ . [3]

2016

2. Simplify  $\frac{5\sqrt{7}+4\sqrt{2}}{3\sqrt{7}+5\sqrt{2}}$ . [4]

2017

2. Simplify

(a)  $\frac{5\sqrt{5}-9}{3+2\sqrt{5}}$ , [4]

(b)  $(2\sqrt{13})^2 - (3\sqrt{7} \times \sqrt{28}) - \frac{5\sqrt{99}}{\sqrt{11}}$ . [4]

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