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**Surds**

(Gaeaf 2005)

2. Simplify

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

expressing your answer in surd form.

[4]

(Haf 2005)

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

$$(a) \quad \sqrt{45} + \sqrt{80} - \sqrt{125};$$

[3]

$$(b) \quad \frac{6 + \sqrt{2}}{2 + \sqrt{2}}.$$

[4]

(Gaeaf 2006)

2. (a) Simplify the following.

$$\sqrt{48} + \sqrt{27} - \frac{6}{\sqrt{3}}$$

[4]

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

[4]

(Haf 2006)

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

$$(a) \quad \frac{5 - \sqrt{3}}{\sqrt{3} + 1},$$

[4]

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

[4]

(Gaeaf 2007)

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

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

[3]

$$(b) \quad \frac{6 + \sqrt{30}}{6 - \sqrt{30}}$$

[4]

(Haf 2007)

2. Simplify

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

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

(Gaeaf 2008)

2. Simplify the following.

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

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

(Haf 2008)

2. Simplify

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

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

(Gaeaf 2009)

2. Simplify

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

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

(Haf 2009)

2. Simplify

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

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

(Gaeaf 2010)

2. Simplify

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

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

(Haf 2010)

2. Simplify

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

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

(Gaeaf 2011)

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

(Haf 2011)

2. Simplify

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

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

(Gaeaf 2012)

2. Simplify

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

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

(Haf 2012)

2. Simplify

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

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

(Gaeaf 2013)

2. Simplify

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

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

(Haf 2013)

2. Simplify

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

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

(Gaeaf 2014)

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

(Haf 2014)

2. Simplify

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

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

(Haf 2015)

2. Simplify

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

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

(Haf 2016)

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

(Haf 2017)

2. Simplify

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

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

(Haf 2018)

$$2. \quad \text{Simplify } \sqrt{500} + (\sqrt{12} \times \sqrt{15}) - \frac{7\sqrt{60}}{\sqrt{3}}. \quad [4]$$