Old Exam Questions – Old Course

**Surds**

(C1 Winter 2005)

**2.** Simplify

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

expressing your answer in surd form. [4]

(C1 Summer 2005)

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

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

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

(C1 Winter 2006)

**2.** *(a)* Simplify the following.

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

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

(C1 Summer 2006)

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

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

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

(C1 Winter 2007)

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

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

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

(C1 Summer 2007)

**2.** Simplify

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

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

(C1 Winter 2008)

**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]

(C1 Summer 2008)

**2.** Simplify

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

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

(C1 Winter 2009)

**2.** Simplify

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

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

(C1 Summer 2009)

**2.** Simplify

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

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

(C1 Winter 2010)

**2.** Simplify

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

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

(C1 Summer 2010)

**2.** Simplify

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

(b) $\left(\sqrt{15}\times\sqrt{20}\right)-\sqrt{75}-\dfrac{\sqrt{60}}{\sqrt{5}}$. [4]

(C1 Winter 2011)

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

(C1 Summer 2011)

**2.** Simplify

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

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

(C1 Winter 2012)

**2.** Simplify

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

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

(C1 Summer 2012)

**2.** Simplify

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

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

(C1 Winter 2013)

**2.** Simplify

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

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

(C1 Summer 2013)

**2.** Simplify

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

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

(C1 Winter 2014)

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

(C1 Summer 2014)

**2.** Simplify

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

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

(C1 Summer 2015)

**2.** Simplify

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

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

(C1 Summer 2016)

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

(C1 Summer 2017)

**2.** Simplify

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

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

(C1 Summer 2018)

**2.** Simplify $\sqrt{500}+\left(\sqrt{12}\times\sqrt{15}\right)-\dfrac{7\sqrt{60}}{\sqrt{3}}$. [4]