


HW 5.1

March 8, 2015 2:50 PM

1. Simplify each of the following and convert it to a mixed radical

<p>a) $\sqrt{72}$ $= \sqrt{36 \times 2}$ $= 6\sqrt{2}$</p>	<p>b) $\sqrt{128}$ $= \sqrt{64 \times 2}$ $= 8\sqrt{2}$</p>	<p>c) $\sqrt{125}$ $= \sqrt{25 \times 5}$ $= 5\sqrt{5}$</p>
<p>d) $\sqrt{600}$ $= \sqrt{100 \times 6}$ $= 10\sqrt{6}$</p>	<p>e) $3\sqrt{8}$ $= 3 \times \sqrt{4 \times 2}$ $= 6\sqrt{2}$</p>	<p>f) $\sqrt{a^3 b^4 c}$ $= \sqrt{a^2 \times a \times b^2 \times b^2 \times c}$ $= a \times \sqrt{a} \times b \times b \times \sqrt{c}$ $= ab^2 \sqrt{ac}$</p>
<p>g) $\sqrt[3]{88}$ $= \sqrt[3]{8} \times \sqrt[3]{11}$ $2^3=8, \sqrt[3]{8}=2$ $= 2(\sqrt[3]{11})$</p>	<p>h) $\sqrt[3]{54}$ $= \sqrt[3]{27 \times 2}$ $3^3=27, \sqrt[3]{27}=3$ $= 3(\sqrt[3]{2})$</p>	<p>i) $\sqrt[4]{96}$ NOTE $= \sqrt[4]{16 \times 6}$ $2^4=16, \sqrt[4]{16}=2$ $= 2(\sqrt[4]{6})$</p>
<p>j) $\sqrt[3]{a^5 b^3 c^4}$ $\sqrt[3]{a^3 \cdot \sqrt[3]{a^2} \cdot \sqrt[3]{b^3} \cdot \sqrt[3]{c^3} \cdot \sqrt[3]{c}}$ $= abc \cdot \sqrt[3]{a^2 c}$</p>	<p>k) $\sqrt[4]{6480}$ $= \sqrt[4]{2^4 \cdot 3^4 \cdot 5}$ $= 2 \cdot 3 \cdot \sqrt[4]{5}$ $= 6(\sqrt[4]{5})$</p> 	<p>l) $\sqrt[n]{a^n b^{n+2} c^{n-1}}$ $= \sqrt[n]{a^n \cdot \sqrt[n]{b^2} \cdot \sqrt[n]{b^2} \cdot \sqrt[n]{c^{n-1}}}$ $= \frac{a \cdot b \cdot \sqrt[n]{b^2} \cdot \sqrt[n]{c^{n-1}}}{\sqrt[n]{b^2}}$ $= abc \cdot \sqrt[n]{\frac{c^{n-1}}{b^2}} = abc \cdot \sqrt[n]{\frac{c^{n-1}}{b^2}}$</p>

2. Simplify by Adding or Subtracting the radicals:

<p>a) $5\sqrt{9} + 2\sqrt{49}$ $= 5 \cdot (3) + 2 \cdot (7)$ $= 15 + 14$ $= 29 //$</p>	<p>b) $2\sqrt{12} - \sqrt{3}$ $= 2\sqrt{4 \cdot 3} - \sqrt{3}$ $= 4\sqrt{3} - \sqrt{3}$ $= 3\sqrt{3} //$</p>	<p>c) $2\sqrt{10} + 7\sqrt{10} - 6\sqrt{10}$ All terms are like terms: $9\sqrt{10} - 6\sqrt{10}$ $= 3\sqrt{10} //$</p>
<p>d) $5\sqrt{7} - 3\sqrt{7} + 6\sqrt{7}$ $2\sqrt{7} + 6\sqrt{7}$ $= 8\sqrt{7} //$</p>	<p>e) $5\sqrt{3} - 7\sqrt{12} + 2\sqrt{27}$ $= 5\sqrt{3} - 7\sqrt{4 \cdot 3} + 2\sqrt{9 \cdot 3}$ $= 5\sqrt{3} - 14\sqrt{3} + 6\sqrt{3}$ $= -9\sqrt{3} + 6\sqrt{3}$ $= -3\sqrt{3} //$</p>	<p>f) $3\sqrt{12} + 2\sqrt{75} - 2\sqrt{3}$ $3\sqrt{4 \cdot 3} + 2(\sqrt{25})\sqrt{3} - 2\sqrt{3}$ $6\sqrt{3} + 10\sqrt{3} - 2\sqrt{3}$ $16\sqrt{3} - 2\sqrt{3}$ $= 14\sqrt{3} //$</p>
<p>g) $\sqrt{54} + \sqrt{150} - 2\sqrt{216}$ $\sqrt{9 \cdot 6} + \sqrt{25 \cdot 6} - 2\sqrt{36 \cdot 6}$ $3\sqrt{6} + 5\sqrt{6} - 12\sqrt{6}$ $8\sqrt{6} - 12\sqrt{6}$ $-4\sqrt{6}$</p>	<p>h) $4\sqrt{12} + \sqrt{300} - 2\sqrt{147}$ $4(4\sqrt{3}) + \sqrt{100 \cdot 3} - 2\sqrt{49 \cdot 3}$ $16\sqrt{3} + 10\sqrt{3} - 14\sqrt{3}$ $26\sqrt{3} - 14\sqrt{3}$ $12\sqrt{3} //$</p>	<p>i) $\frac{1}{3}\sqrt{180} - 3\sqrt{245} - 2\sqrt{80}$ $\frac{1}{3}\sqrt{36 \cdot 5} - 3\sqrt{49 \cdot 5} - 2\sqrt{16 \cdot 5}$ $\sqrt[4]{245}$ $\frac{1}{3}(6\sqrt{5}) - 21\sqrt{5} - 8\sqrt{5}$ $2\sqrt{5} - 21\sqrt{5} - 8\sqrt{5}$ $-27\sqrt{5} //$</p>

<p>j) $4\sqrt{180} - 3\sqrt{250} - \frac{1}{5}\sqrt{125} + \frac{1}{2}\sqrt{40}$</p> <p>$4\sqrt{36\sqrt{5}} - 3\sqrt{25\sqrt{10}} - \frac{1}{5}\sqrt{25(\sqrt{5})} + \frac{1}{2}\sqrt{4\sqrt{10}}$</p> <p>$24\sqrt{5} - 15\sqrt{10} - \sqrt{5} + 2\sqrt{10}$</p> <p>$23\sqrt{5} - 13\sqrt{10}$</p> <p style="text-align: right;">180 20 9 4 5</p>	<p>k) $9\sqrt{75} - \frac{11}{3}\sqrt{18} - 12\sqrt{72} + \frac{5}{2}\sqrt{12}$</p> <p>$9(\sqrt{25})\sqrt{3} - \frac{11}{3}\sqrt{9}(\sqrt{2}) - 12\sqrt{36}(\sqrt{2}) + \frac{5}{2}\sqrt{4}(\sqrt{3})$</p> <p>$45\sqrt{3} - 11\sqrt{2} - 72\sqrt{2} + 5\sqrt{3}$</p> <p>$50\sqrt{3} - 83\sqrt{2}$</p>
<p>l) $\frac{2}{5}\sqrt{125} - \frac{2}{3}\sqrt{243} - \frac{1}{3}\sqrt{45} + \frac{1}{2}\sqrt{48}$</p> <p>$\frac{2}{5}\sqrt{25\sqrt{5}} - \frac{2}{3}\sqrt{81\sqrt{3}} - \frac{1}{3}\sqrt{9(\sqrt{5})} + \frac{1}{2}\sqrt{16(\sqrt{3})}$</p> <p>$\frac{2\sqrt{5}}{5} - 6\sqrt{3} - \frac{\sqrt{5}}{3} + 2\sqrt{3}$</p> <p>$\sqrt{5} - 4\sqrt{3}$</p>	<p>m) $\sqrt{48} - \frac{2}{3}\sqrt{20} - 0.5\sqrt{27} + 2\sqrt{45}$</p> <p>$\sqrt{16\sqrt{3}} - \frac{2}{3}\sqrt{4\sqrt{5}} - \frac{1}{2}\sqrt{9\sqrt{3}} + 2\sqrt{9\sqrt{5}}$</p> <p>$4\sqrt{3} - \frac{4}{3}\sqrt{5} - \frac{3}{2}\sqrt{3} + 6\sqrt{5}$</p> <p>$\frac{5}{2}\sqrt{3} + 14\sqrt{5}$</p>
<p>o) $b\sqrt{27a^3b} - a\sqrt{3ab^3} - 2\sqrt{75a^3b^3} + 4\sqrt[3]{a^4b^4}$</p> <p>$b\sqrt{9a^2\sqrt{3b}} - a\sqrt{b^2\sqrt{3ab}} - 2\sqrt{25a^2b^2(\sqrt{3ab})} + 4\sqrt[3]{a^3b^3(\sqrt[3]{ab})}$</p> <p>$3ab\sqrt{3b} - ab\sqrt{3ab} - 10ab\sqrt{3ab} + 4ab\sqrt[3]{ab}$</p> <p>$3ab\sqrt{3b} - 11ab\sqrt{3ab} + 4ab\sqrt[3]{ab}$</p>	<p>p) $\frac{\sqrt{8a}}{4} + \frac{\sqrt{27b}}{3} - 0.3\sqrt{50a} - 4\sqrt{75b}$</p> <p>$\frac{2\sqrt{2a}}{4} + \frac{3\sqrt{3b}}{3} - \frac{1}{3}\sqrt{25\sqrt{2a}} - 4\sqrt{25\sqrt{3b}}$</p> <p>$\frac{\sqrt{2a}}{2} + \sqrt{3b} - \frac{5}{3}\sqrt{2a} - 20\sqrt{3b}$</p> <p>$\frac{3\sqrt{2a}}{6} - \frac{10}{6}\sqrt{2a} + \sqrt{3b} - 20\sqrt{3b}$</p> <p>$= -\frac{7}{6}\sqrt{2a} - 19\sqrt{3b}$</p>

3. The area of a square is 8 and the perimeter is $a\sqrt{b}$, what are the values of "a" and "b"?

$A=8$ $s=\sqrt{8}$ PERIMETER = $4 \times \sqrt{8}$
 $= 4 \times 2\sqrt{2}$
 $= 8\sqrt{2}$

4. Arrange each of the following from Least to Greatest:

a) $-6\sqrt{2}$, $-3\sqrt{7}$, $-2\sqrt{17}$, $-4\sqrt{5}$, $-2\sqrt{21}$, $-5\sqrt{3}$

$-\sqrt{36\sqrt{2}}$, $-\sqrt{9\sqrt{7}}$, $-\sqrt{4\sqrt{17}}$, $-\sqrt{16\sqrt{5}}$, $-\sqrt{4\sqrt{21}}$, $-\sqrt{25\sqrt{3}}$

$= -\sqrt{72}$, $-\sqrt{63}$, $-\sqrt{68}$, $-\sqrt{80}$, $-\sqrt{84}$, $-\sqrt{75}$

④ ⑥ ⑤ ② ① ③

1) $\sqrt{1}$ 2) $\sqrt{7}$ 3) $\sqrt{0.5}$ 4) $\sqrt{0}$ 5) $\sqrt{5}$ 6) $\sqrt{2}$

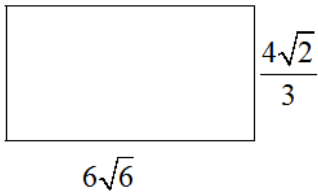
b) $6\sqrt{0.1}$, $3\sqrt{0.7}$, $7\sqrt{0.05}$, $2\sqrt{0.8}$, $4\sqrt{0.5}$, $5\sqrt{0.3}$

$$\sqrt{36}\sqrt{\frac{1}{10}}, \sqrt{9}\cdot\sqrt{\frac{7}{10}}, \sqrt{49}\sqrt{\frac{1}{20}}, \sqrt{4}\sqrt{\frac{8}{10}}, \sqrt{16}\sqrt{\frac{5}{10}}, \sqrt{25}\sqrt{\frac{3}{10}}$$

$$\sqrt{\frac{36}{10}}, \sqrt{\frac{63}{10}}, \sqrt{\frac{49}{20}}, \sqrt{\frac{32}{10}}, \sqrt{\frac{80}{10}}, \sqrt{\frac{75}{10}}$$

(3) (4) (1) (2) (6) (5)

5. Find the PERIMETER and AREA of the following rectangle:



$$\begin{aligned} \text{PERIMETER} &= \frac{4\sqrt{2}}{3} + \frac{4\sqrt{2}}{3} + 6\sqrt{6} + 6\sqrt{6} \\ &= \frac{8\sqrt{2}}{3} + 12\sqrt{6} \end{aligned}$$

$$\begin{aligned} \text{Area} &= \frac{4\sqrt{2}}{3} \cdot 6\sqrt{6} \\ &= \frac{24\sqrt{4}\sqrt{3}}{3} \\ &= \frac{48\sqrt{3}}{3} // \end{aligned}$$