Name:_____   Date:_____

HW Pre-Calculus 11 Section 5.2 Multiplying Dividing and Rationalizing with Radicals

1. Multiply each of the following radicals:

a) $\sqrt{24} \times \sqrt{6}$	b) $3\sqrt{12} \times 5\sqrt{8}$	c) $5\sqrt[3]{50} \times 3\sqrt[3]{60}$
d) $-4\sqrt[3]{-100} \times 2\sqrt[3]{54}$	e) $\sqrt[3]{a^2bc^3} \times \sqrt[3]{a^5b^4c^2}$	f) $\sqrt[4]{32x^3y} \times \sqrt[4]{64x^2y^7}$
g) $2\sqrt{3}\left(4\sqrt{21} + 5\sqrt{15}\right)$	h) $4\sqrt{5}\left(6\sqrt{40} + 3\sqrt{50} - 2\sqrt{90}\right)$	i) $5\sqrt{6}\left(4\sqrt{24} - 3\sqrt{48} - 5\sqrt{54}\right)$

j) $\left(3\sqrt{2} + 4\sqrt{3}\right)\left(5\sqrt{3} - \sqrt{8}\right)$	k) $\left(\sqrt{6} - \sqrt{8}\right)\left(\sqrt{2} + \sqrt{5} + 4\right)$
L) $\left(3\sqrt[3]{8x^2} + \sqrt[3]{4x^2}\right)\left(\sqrt[3]{2x^2} - 6\sqrt[3]{8x^2}\right)$	m) $\left(8a - 6\sqrt[3]{3r}\right)\left(2\sqrt[3]{18r^2} + 4\sqrt[3]{45r}\right)$

2. Divide and Rationalize each of the following radicals:

$a) \dfrac{\sqrt{24}}{\sqrt{3}}$	$b) \dfrac{3\sqrt{20}}{2\sqrt{10}}$	$c) \dfrac{3\sqrt{18}}{5\sqrt{24}}$
$d) \dfrac{1}{\sqrt{5}} - \dfrac{1}{\sqrt{3}}$	$e) \dfrac{1}{\sqrt{3}} + \dfrac{2}{\sqrt{6}}$	$f) \dfrac{5}{\sqrt{5}} - \dfrac{8}{\sqrt{2}}$
$g) \dfrac{3\sqrt{48}}{2\sqrt{75}} - \dfrac{2\sqrt{24}}{\sqrt{96}}$	$h) \dfrac{3\sqrt{5}}{\sqrt{20}} + \dfrac{4\sqrt{3}}{\sqrt{27}}$	$i) \dfrac{2\sqrt{3}}{\sqrt{9}} - \dfrac{3\sqrt{5}}{\sqrt{125}}$
$j) \dfrac{1}{\sqrt{2} - \sqrt{3}}$	$k) \dfrac{2}{2\sqrt{3} + 5}$	$L) \dfrac{\sqrt{2}}{2\sqrt{3} + \sqrt{5}}$
$m) \dfrac{\sqrt{2} + \sqrt{3}}{\sqrt{3} - \sqrt{2}}$	$n) \dfrac{5\sqrt{3}}{2\sqrt{2} - 3\sqrt{3}}$	$p) \dfrac{x^4 + x^2}{\sqrt{x^3}}$

Q) $\dfrac{5}{\sqrt[3]{x^2}}$	R) $\dfrac{\sqrt[3]{3}+4\sqrt[3]{3}}{\sqrt[3]{3^2}}$	s) $\dfrac{\sqrt[4]{6}-3\sqrt[4]{6}}{\sqrt[4]{216}}$

3. Is the following statement true or false? Explain: $\sqrt{-3}\times\sqrt{-27}=9$

4. The following student rationalized the expression with the steps shown. Indicate any errors that you see:

$$\frac{5-\sqrt{a}}{\sqrt{a}-4}=\frac{5-\sqrt{a}}{\sqrt{a}-4}\times\frac{\left(\sqrt{a}+4\right)}{\left(\sqrt{a}+4\right)}$$

$$=\frac{5\sqrt{a}-a+20}{a-4}$$

$$=\frac{5\sqrt{a}+20}{-4}$$

5. Find the unknown value "K" in each of the following expressions:

a) $K\times3\sqrt{24}=2\sqrt{3}\times6\sqrt{10}$

b) $8\sqrt{3}=\dfrac{4\sqrt{48}}{\sqrt{K}}$

6. Find the volume of a box given the dimensions: Height: $3\sqrt{2}+4$, Width: $4\sqrt{5}-2\sqrt{3}$, Length: $4\sqrt{5}+2\sqrt{3}$

7. Each right triangle in the figure shown has a hypotenuse 4cm and the shortest side 2 cm. Find the perimeter of the figure:
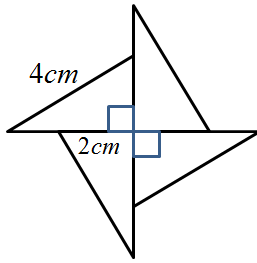
8. Challenge: Find the sum of the expression without a calculator:

$$\frac{1}{3+2\sqrt{2}}+\frac{1}{2\sqrt{2}+\sqrt{7}}+\frac{1}{\sqrt{7}+\sqrt{6}}+\frac{1}{\sqrt{6}+\sqrt{5}}+\frac{1}{\sqrt{5}+2}+\frac{1}{2+\sqrt{3}}$$