

Name: _____

Date: _____

Math 8 Honours: Section 4.1 What are Square Roots and Simplifying Radicals

1. Simplify each of the following radicals:

i) $\sqrt{36}$	ii) $\sqrt{25}$	iii) $\sqrt{144}$	iv) $\sqrt{3025}$	v) $\sqrt{289}$
vi) $\sqrt{169}$	vii) $\sqrt{225}$	viii) $\sqrt{14641}$	ix) $\sqrt{729}$	x) $\sqrt{961}$
ix) $\sqrt{9801}$	x) $\sqrt{36} - \sqrt{1225}$	xi) $\sqrt{9} - \sqrt{\sqrt{81}}$	xii) $\sqrt{196} + \sqrt{64}$	xiii) $\sqrt{121} - \sqrt{\sqrt{16}}$
ixx) $\sqrt{\frac{9}{121}}$	xx) $\sqrt{\frac{100}{289}}$	xxi) $\sqrt{\frac{361}{529}}$	xxii) $\sqrt{\frac{48}{75}}$	xxiii) $\sqrt{\frac{343}{252}}$

2. Convert each of the following to a Mixed Radical

i) $\sqrt{32}$	ii) $\sqrt{24}$	iii) $\sqrt{150}$	iv) $\sqrt{75}$	v) $\sqrt{108}$
vi) $\sqrt{162}$	vii) $\sqrt{11163}$	viii) $\sqrt{216}$	ix) $\sqrt{3731}$	x) $\sqrt{847}$
ix) $\sqrt{36+64+128}$	x) $\sqrt{27+81+9+243}$	xi) $\sqrt{8\sqrt{324}}$	xii) $\sqrt{219+\sqrt{576}+\sqrt{75}}$	xiii) $\sqrt{348+\sqrt{36}+\sqrt{81}}$

3. Multiply and Simplify each of the following radicals:

i) $12\sqrt{3} \times (-3\sqrt{18})$	ii) $3\sqrt{24} \times \sqrt{54}$	iii) $5\sqrt{108} \times 4\sqrt{24}$
iv) $3\sqrt{7} \times 2\sqrt{6} \times 12\sqrt{14}$	v) $3\sqrt{48} \times 7\sqrt{75}$	vi) $8\sqrt{24} \times -7\sqrt{72}$
vii) $9\sqrt{108} \times -4\sqrt{28} \times 2\sqrt{343}$	viii) $2\sqrt{12} \times 7\sqrt{15} \times 9\sqrt{10}$	ix) $12\sqrt{1\frac{1}{9}} \times 3\sqrt{\frac{6}{15}}$
x) $4\sqrt{0.3} \times (-3\sqrt{0.6})$	xi) $5\sqrt{1\frac{2}{11}} \times (-8\sqrt{0.27})$	xii) $-8\sqrt{0.343} \times (-2\sqrt{0.7})$

4. Arrange each expression in order from least to greatest

i) 5, $4\sqrt{2}$, $2\sqrt{6}$, $3\sqrt{3}$

ii) $4\sqrt{5}$, $5\sqrt{3}$, $2\sqrt{19}$, $6\sqrt{2}$, $3\sqrt{9}$, $\sqrt{70}$

5. Simplify each of the following radicals:

i) $\sqrt{5!}$

ii) $\sqrt{5 \times 8!}$

iii) $\sqrt{\frac{9! \times 3!}{5!}}$

iv) $\sqrt{4^{a-1} + 4^{a-1} + 4^{a-1} + 4^{a-1}}$

v) $\sqrt{\frac{6 \times 4 \times 2 \times 0!}{5 \times 3}}$

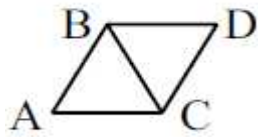
vi) $\sqrt[3]{7! \times 7! \times 8!}$

6. The area of a square is 845cm^2 . What is the perimeter of the square? Express your answer as a mixed radical

7. One side of a square is $12 + 3x$ and the other side is $32 + x$. What is the value of the diagonal. Express your answer as a mixed radical

8. What is the value of "n" such that the equation is true? $10^n = 10^{-5} \times \sqrt{\frac{10^{73}}{0.001}}$

9. In the figure, triangles ABC and BCD are equilateral triangles. What is the value of $AD \div BC$ when expressed in simplest radical form?



10. Suppose that $\frac{p}{q} = \sqrt{3}$. What is the value of $\frac{2p}{p-q}$? Express your answer in simplest radical form.