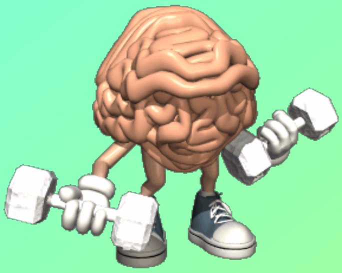


Warm Up

1. Order the following radicals from least to greatest use chart

$\sqrt{22}$ [redacted] $\sqrt[3]{-10}$ [redacted] $\sqrt[4]{256} = 4$ [redacted] $\sqrt[5]{-32} = -2$ [redacted]

$\sqrt{16}$ → $\sqrt{25}$

4 → 5

≈ 4.7

$\sqrt[3]{-8}$ $\sqrt[3]{-27}$

-2 -3

≈ -2.1

$\sqrt[3]{-10}$, $\sqrt[5]{-32}$, $\sqrt[4]{256}$, $\sqrt{22}$

$3\sqrt[3]{6}$

2. **Reduce each radical:** show work

a) $\sqrt{128}$ [redacted]

$\sqrt{64 \times 2}$

$\sqrt{64} \times \sqrt{2}$

$8\sqrt{2}$

b) $\sqrt[3]{162}$ [redacted]

$\sqrt[3]{27 \times 6}$

$\sqrt[3]{27} \times \sqrt[3]{6}$

$3\sqrt[3]{6}$

Pg 218 4,7a, 8a, 9, 10, 11

homework solutions

Grade 10

Page 218 Questions 4, 7a, 8a, 9, 10, 11

4a) $\sqrt{8} = \sqrt{(4)(2)}$

$= \sqrt{4}\ \sqrt{2}$

$= 2\sqrt{2}$

4b) $\sqrt{12} = \sqrt{(4)(3)}$

$= \sqrt{4}\ \sqrt{3}$

$= 2\sqrt{3}$

4c) $\sqrt{32} = \sqrt{(16)(2)}$

$= \sqrt{16}\ \sqrt{2}$

$= 4\sqrt{2}$

4 d) $\sqrt{50} = \sqrt{(25)(2)}$

$= \sqrt{25}\ \sqrt{2}$

$= 5\sqrt{2}$

4e) $\sqrt{18} = \sqrt{(9)(2)}$

$= \sqrt{9}\ \sqrt{2}$

$= 3\sqrt{2}$

4f) $\sqrt{27} = \sqrt{(9)(3)}$

$= \sqrt{9}\ \sqrt{3}$

$= 3\sqrt{3}$

4g) $\sqrt{48} = \sqrt{(16)(3)}$

$= \sqrt{16}\ \sqrt{3}$

$= 4\sqrt{3}$

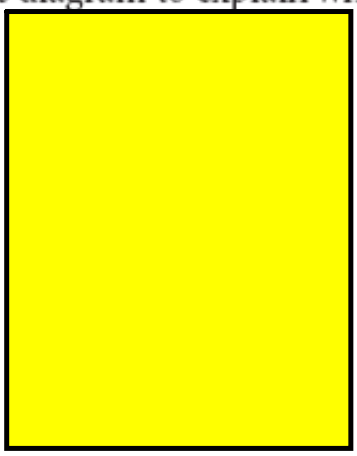
4h) $\sqrt{75} = \sqrt{(25)(3)}$

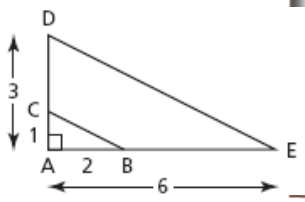
$= \sqrt{25}\ \sqrt{3}$

$= 5\sqrt{3}$

homework solutions

7. a) Use the diagram to explain why $\sqrt{45} = 3\sqrt{5}$.





$c^2 = a^2 + b^2$

$c = \sqrt{a^2 + b^2}$

$= \sqrt{6^2 + 3^2}$

$= \sqrt{36 + 9}$

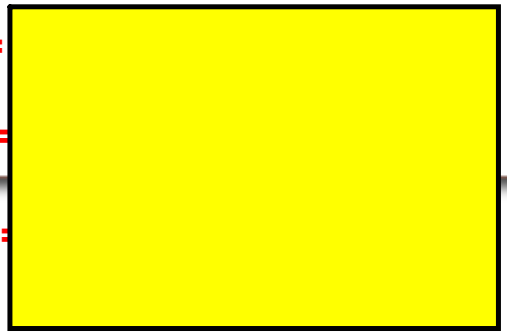
$c = \sqrt{45}$

b) Use algebra to verify that $\sqrt{45} = 3\sqrt{5}$.

$\sqrt{45}$ =

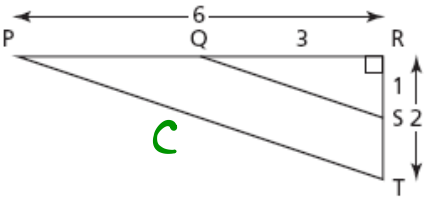
=

=



homework solutions

8. a) Use the diagram to explain why $\sqrt{40} = 2\sqrt{10}$.



$$c = \sqrt{a^2 + b^2}$$

$$= \sqrt{6^2 + 2^2}$$

$$= \sqrt{36 + 4}$$

$$c = \sqrt{40}$$

b) Use algebra to verify that $\sqrt{40} = 2\sqrt{10}$.

homework solutions

9) Rewriting $\sqrt{50}$ as $\sqrt{25} \cdot \sqrt{2}$ helps you simplify $\sqrt{50}$ since you can take the square root of the perfect square 25. You cannot take the square root of either 10 or 5 so rewriting $\sqrt{50}$ as $\sqrt{10} \cdot \sqrt{5}$ does not help. You need one number to be a perfect square number.

$\sqrt{73} \Rightarrow$ prime #

10a) $\sqrt{90} = \sqrt{(9)(10)}$
$= \sqrt{9} \cdot \sqrt{10}$
$= 3\sqrt{10}$

10b) $\sqrt{63} = \sqrt{(9)(7)}$
$= \sqrt{9} \cdot \sqrt{7}$
$= 3\sqrt{7}$

10c) $\sqrt{108} = \sqrt{(36)(3)}$
$= \sqrt{36} \cdot \sqrt{3}$
$= 6\sqrt{3}$

10d) $\sqrt{600} = \sqrt{(100) \cdot (6)}$
$= \sqrt{100} \cdot \sqrt{6}$
$= 10\sqrt{6}$

10e) $\sqrt{54} = \sqrt{(9)(6)}$
$= \sqrt{9} \cdot \sqrt{6}$
$= 3\sqrt{6}$

10f) $\sqrt{91}$
Already in Simplest form.

homework solutions

10g) $\sqrt{28} = \sqrt{(4)\cdot(7)}$

$= \sqrt{4}\cdot\sqrt{7}$

$\boxed{= 2\sqrt{7}}$

10h) $\sqrt{33}$

Already in Simplest form

10i) $\sqrt{112} = \sqrt{(16)(7)}$

$= \sqrt{16}\cdot\sqrt{7}$

$\boxed{= 4\sqrt{7}}$

11a) $\sqrt[3]{16} = \sqrt[3]{(8)(2)}$

$= \sqrt[3]{8}\cdot\sqrt[3]{2}$

$= 2\sqrt[3]{2}$

11b) $\sqrt[3]{81} = \sqrt[3]{(27)(3)}$

$= \sqrt[3]{27}\cdot\sqrt[3]{3}$

$\boxed{= 3\sqrt[3]{3}}$

11c) $\sqrt[3]{256} = \sqrt[3]{(64)(4)}$

$= \sqrt[3]{64}\cdot\sqrt[3]{4}$

$\boxed{= 4\sqrt[3]{4}}$

11d) $\sqrt[3]{128} = \sqrt[3]{(64)\cdot(2)}$

$= \sqrt[3]{64}\cdot\sqrt[3]{2}$

$= 4\sqrt[3]{2}$

homework solutions

11e) $\sqrt[3]{60}$ =

Already in Simplest form

11f) $\sqrt[3]{192} = \sqrt[3]{(64)(3)}$

$= \sqrt[3]{64} \cdot \sqrt[3]{3}$

$= 4\sqrt[3]{3}$

11g) $\sqrt[3]{135} = \sqrt[3]{(27)(5)}$

$= \sqrt[3]{(27)} \cdot \sqrt[3]{(5)}$

$= 3\sqrt[3]{5}$

11h) $\sqrt[3]{(100)}$ =

Already in Simplest form

11i) $\sqrt[3]{500} = \sqrt[3]{(125)\cdot(4)}$

$= \sqrt[3]{125} \cdot \sqrt[3]{4}$

$= 5\sqrt[3]{4}$

11j) $\sqrt[3]{375} = \sqrt[3]{(125)(3)}$

$= \sqrt[3]{125} \cdot \sqrt[3]{3}$

$= 5\sqrt[3]{3}$

Use either prime factorization or product of n^{th} factors

2. Write each radical in simplest form, if possible.

a) $\sqrt{30}$

b) $\sqrt[3]{32}$

c) $\sqrt[4]{48}$

d) $\sqrt[3]{375}$

Mixed to Entire

Express as a reduced mixed radical.

$5\sqrt{18}$

Entire Radicals
(mixed ⇒ entire)

mixed → entire

$a\sqrt[n]{b} \rightarrow \sqrt[n]{(a^n)* b}$

Express as an entire radical.

$3\sqrt{5}$

$= \sqrt{3^2 \times 5}$

$= \sqrt{9 \times 5}$

$= \sqrt{45}$

Express as an entire radical.

$2\sqrt[4]{7}$

$= \sqrt[4]{2^4 \times 7}$

$= \sqrt[4]{16 \times 7}$

$= \sqrt[4]{112}$

Mixed to Entire

$3\sqrt[5]{2}$

$\sqrt[5]{3^5 \times 2}$

$= \sqrt[5]{243 \times 2}$

$= \sqrt[5]{486}$

$7\sqrt[3]{-4}$

$= \sqrt[3]{7^3 \times -4}$

$= \sqrt[3]{343 \times -4}$

$= \sqrt[3]{-1372}$

$2\sqrt[4]{5}$

$= \sqrt[4]{2^4 \times 5}$

$= \sqrt[4]{16 \times 5}$

$= \sqrt[4]{80}$

1 Can this number be simplified?

A Yes

B No

$\sqrt{27} \Rightarrow$ Mixed

$\sqrt{9 \times 3}$

$\sqrt{9} \times \sqrt{3}$

$3\sqrt{3}$

Quiz Outline

1) Evaluate

$\sqrt[3]{2197} = 13$

2) Estimate (show work)

$\sqrt[3]{500}$

$\sqrt[3]{343}$ $\sqrt[3]{512}$

7 8

≈ 7.8

#3) Entire to Mixed

$\sqrt[3]{250}$

$= \sqrt[3]{125 \times 2}$

$= \sqrt[3]{125} \times \sqrt[3]{2}$

$= 5\sqrt[3]{2}$

Quiz tomorrow

#4 Mixed to Entire

$3\sqrt[4]{5}$

$= \sqrt[4]{(3^4) \times 5}$

$\sqrt[4]{\quad}$

Homework

Quiz tomorrow

Page: 218-219

Questions:

Entire → Mixed

8b $\sqrt{40}$

7 (b)

8 (b)

10 (a,c,e,)

11 (e, g,i)

12 (b,d,f,h,j)

13

14

15

17 a,c

18 a,c

19-23