

# Radicals Practice Test

## A. Real Numbers:

Which row from the following table best describes the numbers below?

	Whole	Integer	Rational	Irrational	Real
A	☆	☆	☆		☆
B		☆	☆		☆
C			☆		☆
D				☆	☆

1. 19 786

A

2.  $-3\sqrt{6}$

D

3.  $-\sqrt{144}$

B

4.  $-0.463\ 721\ 457\ \dots$

D

5.  $-10.456\ 345\ 634\dots$

C

6.  $\sqrt{56-48}$

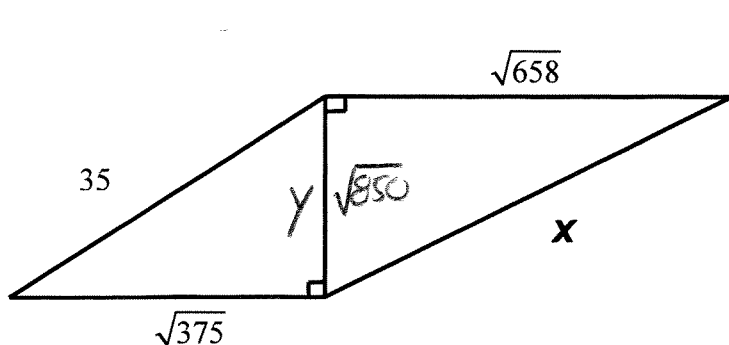
D

## B. Evaluating Radicals:

1. $\sqrt{121}$ $= 11$	2. $-\sqrt{144-44}$ $= -\sqrt{100}$ $= -10$	3. $\sqrt[3]{243}$ $= 3$
---------------------------	---	-----------------------------

**C. Pythagorean Theorem:**

1. Solve for 'x'.



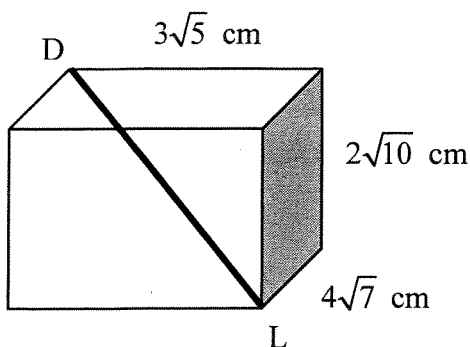
$$y^2 = 35^2 - (\sqrt{375})^2$$

$$y^2 = 850$$

$$x^2 = 850 + (\sqrt{658})^2$$

$$x = \underline{\underline{38.83}}$$

2. Determine the length of the line DL to 2 decimal places.



$$DL^2 = (3\sqrt{5})^2 + (2\sqrt{10})^2 + (4\sqrt{7})^2$$

$$DL^2 = 45 + 40 + 112$$

$$DL = 14.03$$

**D. Convert the following to Mixed Radicals:**

1. $\sqrt{588}$ $= \sqrt{2 \cdot 2 \cdot 7 \cdot 7 \cdot 3}$ $= 14\sqrt{3}$	2. $\sqrt[3]{81x^5y^7}$ $= 3xy^2\sqrt[3]{3x^2y}$	3. $5\sqrt{175}$ $= 5\sqrt{25 \cdot 7}$ $= 25\sqrt{7}$
---	---	--

**D. Convert the following to Entire Radicals:**

1. $2\sqrt{13}$ $= \sqrt{52}$	2. $6\sqrt{5}$ $= \sqrt{180}$	3. $-5\sqrt{8}$ $= -\sqrt{200}$
----------------------------------	----------------------------------	------------------------------------

**E. Multiplying Radicals:**

1. $\sqrt{70} \times \sqrt{80}$ $= \sqrt{7 \cdot 10 \cdot 2 \cdot 2 \cdot 2 \cdot 10}$ $= 20\sqrt{14}$	2. $-2\sqrt{98} \times 7\sqrt{10} \times 9\sqrt{15}$ $= -126\sqrt{7 \cdot 7 \cdot 2 \cdot 2 \cdot 5 \cdot 5 \cdot 3}$ $= -8820\sqrt{3}$
--	---

**F. Adding and Subtracting Radicals:**

1. $5\sqrt{7} + 11\sqrt{3} - 13\sqrt{7}$ $= -8\sqrt{7} + 11\sqrt{3}$	2. $5\sqrt{108} + 3\sqrt{75} - 6\sqrt{192}$ $= 5\sqrt{36 \cdot 3} + 3\sqrt{25 \cdot 3} - 6\sqrt{64 \cdot 3}$ $= 30\sqrt{3} + 15\sqrt{3} - 48\sqrt{3}$ $= -3\sqrt{3}$
3. $\frac{7}{2}\sqrt{28} - \frac{2}{5}\sqrt{175} - \frac{9}{3}\sqrt{63}$ $= 7\sqrt{7} - 2\sqrt{7} - 9\sqrt{7}$ $= -4\sqrt{7}$	

**G. Expand and Simplify the following:**

1. $3\sqrt{3} (2\sqrt{15} - 5\sqrt{6})$ $= 18\sqrt{5} - 45\sqrt{3}$	2. $(3\sqrt{6} - 5\sqrt{2})(4\sqrt{6} + 5\sqrt{2})$ $= 72 + 30\sqrt{3} - 60\sqrt{3} - 50$ $= 22 - 30\sqrt{3}$
--	---

**H. Divide the following Radicals [Rationalize the denominator whenever necessary]:**

1. $\frac{\sqrt{56}}{\sqrt{7}} = \frac{\sqrt{8}}{1}$ $= 2\sqrt{2}$	2. $\frac{2\sqrt{50}}{6\sqrt{10}} = \frac{\sqrt{5}}{3}$
3. $\frac{2-6\sqrt{3}}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}}$ $= \frac{2\sqrt{5} - 6\sqrt{15}}{5}$	4. $\frac{\sqrt{10}}{\sqrt{2}-\sqrt{5}} \cdot \frac{\sqrt{2}+\sqrt{5}}{\sqrt{2}+\sqrt{5}}$ $= \frac{2\sqrt{5} + 5\sqrt{2}}{-3}$
5. $\frac{6}{2\sqrt{5}+3\sqrt{2}} \cdot \frac{2\sqrt{5}-3\sqrt{2}}{2\sqrt{5}-3\sqrt{2}}$ $= \frac{12\sqrt{5} - 18\sqrt{2}}{20 - 18}$ $= \frac{12\sqrt{5} - 18\sqrt{2}}{2}$ $= 6\sqrt{5} - 9\sqrt{2}$	6. $\frac{3\sqrt{5}-2\sqrt{2}}{2\sqrt{7}+7\sqrt{3}} \cdot \frac{2\sqrt{7}-7\sqrt{3}}{2\sqrt{7}-7\sqrt{3}}$ $= \frac{6\sqrt{35} - 21\sqrt{15} - 4\sqrt{14} + 14\sqrt{6}}{28 - 147}$ $= \frac{6\sqrt{35} - 21\sqrt{15} - 4\sqrt{14} + 14\sqrt{6}}{-119}$