1

What is the value of x?

(1) $\sqrt{x^4}=9$ --> $x^2=9$ --> $x=3$ or $x=-3$. Not sufficient.

(2) $\sqrt{x^2}=-x$ --> $|x|=-x$ --> just says that x is not positive (x could be 0 or any negative number). Not sufficient.

(1)+(2) As from (2) x is not positive then from (1) $x=-3$. Sufficient.

Answer: C.

2

If y is a positive integer is $\sqrt{y}$ an integer?

Note that as y is a positive integer then $\sqrt{y}$ is either a positive integer or an irrational number. Also note that the question basically asks whether y is a perfect square.

(1) $\sqrt{4*y}$ is not an integer --> $\sqrt{4*y}=2*\sqrt{y}\neq integer$ --> $\sqrt{y}\neq integer$. Sufficient.

(2) $\sqrt{5*y}$ is an integer --> y can not be a prefect square because if it is, for example if $y=x^2$ for some positive integer x then $\sqrt{5*y}=\sqrt{5*x^2}=x\sqrt{5}\neq integer$. Sufficient.

Answer: D.

3

If x is a positive integer, is $\sqrt{x}$ an integer?

As given that x **is a positive integer** then $\sqrt{x}$ is either an integer itself or an irrational number.

(1) $\sqrt{4x}$ is an integer --> $2\sqrt{x}=integer$ --> $2\sqrt{x}$ to be an integer $\sqrt{x}$ must be an integer or integer/2, but as x is an integer, then $\sqrt{x}$ can not be integer/2, hence $\sqrt{x}$ is an integer. Sufficient.

(2) $\sqrt{3x}$ is not an integer --> if $x=9$, condition $\sqrt{3x}=\sqrt{27}$ is not an integer satisfied and $\sqrt{x}=3$ IS an integer, BUT if $x=2$, condition $\sqrt{3x}=\sqrt{6}$ is not an integer satisfied and $\sqrt{x}=\sqrt{2}$ IS NOT an integer. Two different answers. Not sufficient.

Answer: A.

4

Is $\sqrt{7x}$ an integer?

Notice that we are not told that x is an integer.

(1) $\sqrt{\frac{x}{7}}$ is an integer. Given that $\sqrt{\frac{x}{7}}=integer$ --> square it: $\frac{x}{7}=integer^2$ --> $x=7*integer^2$. So, $\sqrt{7x}=\sqrt{7*(7*integer^2)}=7*integer=integer$. Sufficient.

(2) $\sqrt{28x}$ is an integer. If $x=\frac{1}{28}$, then $\sqrt{7x}=\frac{1}{2}\neq integer$ BUT if $x=0$, then $\sqrt{7x}=0=integer$. Not sufficient.

Answer: A.

5

What is the cube root of w?

(1) The 5th root of w is 64 --> $\sqrt[5]{w}=64$ --> we can find w, hence we can find $\sqrt[3]{w}$: $w=64^5$ --> $\sqrt[3]{w}=\sqrt[3]{64^5}$. Sufficient.

(2) The 15th root of w is 4 --> $\sqrt[15]{w}=4$. The same here. Sufficient.

Answer: D.