1

(1) $vw = v^2$ --> $vw - v^2 = 0$ --> $v(w-v) = 0$: either $v = 0$ or $v = w$, but as we are told that v and w are **different** integers then this case is out, so $v = 0$. Sufficient.

(2) $w = 2$. Clearly not sufficient.

Answer: A.

2

$x(x-5)(x+2) = 0$ --> $x = 0$ or $x = 5$ or $x = -2$. Question is $x<0$ or is $x = -2$?

(1) x^2 - 7x ≠ 0 --> $x(x-7) \neq 0$ --> $x \neq 0$ and $x \neq 7$, so x can be 5 or -2 (from the stem as $x = 0$ is out). Not sufficient.

(2) x^2 -2x -15 ≠ 0 --> $(x+3)(x-5) \neq 0$ --> $x \neq -3$ and $x \neq 5$, so x can be 0 or -2 (from the stem as $x = 5$ is out). Not sufficient.

(1)+(2) As $x = 0$ and $x = 5$ are out, only value left is $x = -2$, so x is negative. Sufficient.

Answer: C.

3

If xy > 0, does xy - y = 3?

(1) xy = 3 --> question becomes: is $3 - y = 3$? or is $y = 0$? Since given that $xy > 0$ (or the same $xy = 3$) then it's clear that $y \neq 0$ so we have the answer NO. Sufficient.

(2) y - 1 = 0 --> question becomes: is $x = 4$? We don't know that. Not sufficient.

Answer: A.

4

Given: a and b are integers, also $\sqrt{a^3 - a^2 - b} = 7$ --> $a^3 - a^2 - b = 49$

(1) a^2 - a = 12 --> $a = -3$ or $a = 4$. Now, both values of a give an integer solution for b ($b = 85$ or $b = -1$), so both values are valid. Not sufficient.

(2) b^2 - b = 2 --> $b = -1$ or $b = 2$ --> if $b = -1$ then $a^3 - a^2 = 48$ --> $a^2(a-1) = 48$ --> $a = 4 = integer$ BUT if if $b = 2$ then $a^3 - a^2 = 51$ --> $a^2(a-1) = 51 = 3*17$ --> this equation has no integer solution for a, hence only the first case is valid: $b = -1$ and $a = 4 = integer$. Sufficient.

Answer: B.

5

Given: x and y are **positive integers** and $y = \sqrt{9-x}$ --> $y^2 = 9 - x$ --> y^2 is a **positive perfect square less than 9**: so $y^2 = 4 = 2^2$ if $x = 5$ or $y^2 = 1 = 1^2$ if $x = 8$.

(1) x < 8 --> $x = 5$ and $y = 2$. Sufficient.
(2) y > 1 --> $y = 2$. Sufficient.

Answer: D.