1

If $v*m*t$ **not** $=0$**, is** $v^2*m^3*t^{-4}>0$**?**

$v*m*t\neq0$ means that none of the unknowns equals to zero.

Is $v^2*m^3*t^{-4}>0$? --> is $\frac{v^2*m^3}{t^4}>0$? As v^2 and t^4 are positive (remember none of the unknowns equals to zero) this inequality will hold true if and only $m^3>0$, or, which is the same, when $m>0$.

(1) $m>v^2$ --> m is more than some positive number (v^2), hence m is positive. Sufficient.

(2) $m>t^{-4}$ --> $m>\frac{1}{t^4}$ --> Again m is more than some positive number ($\frac{1}{t^4}$), hence m is positive. Sufficient.

Answer: D.

2

If 1/3 < z <2/3 , then what is the value of z?

(1) When positive integer x is divided by 2, the result is z --> $z=\frac{x}{2}$ --> $\frac{1}{3}<\frac{x}{2}<\frac{2}{3}$ --> $\frac{2}{3}<x<\frac{4}{3}$ --> since x is an integer then $x=1$ (the only integer in that range) --> $z=\frac{x}{2}=\frac{1}{2}$. Sufficient.

(2) When positive even integer y is divided by 12, the result is z --> $z=\frac{y}{12}$ --> $\frac{1}{3}<\frac{y}{12}<\frac{2}{3}$ --> $4<y<8$ --> since y is an **even** integer then $y=6$ (the only even integer in that range) --> $z=\frac{y}{12}=\frac{1}{2}$. Sufficient.

Answer: D.

3

If xy < 4, is x < 2 ?

Notice that in order xy<4 to hold true at least one of the multiples must be less than 2 (if both x and y are more than or equal to 2 then xy>2).

(1) y > 1. If for example $y=1.5>1$ then x can be 1, so less than 2 or 2 so not less than 2. Not sufficient.

(2) y > x. According to above: $y>x\geq2$ is not possible since in this case $xy>4$, so x must be less than 2. Sufficient.

Answer: B.

4

Note: x is an integer.

(1) $4<(x-1)*(x-1)<16$ --> $4<(x-1)^2<16$ --> $(x-1)^2$ is a perfect square between 4 and 16 --> there is only one perfect square: 9 --> $(x-1)^2=9$ --> $x-1=3$ or $x-1=-3$ --> $x=4$ or $x=-2$. Two answers, not sufficient.

(2) $4<(x+1)*(x-1)<16$ --> $4<x^2-1<16$ --> $5<x^2<17$ --> x^2 is a perfect square between 5 and 17 --> there are two perfect squares : 9 and 16 --> $x^2=9$ or $x^2=16$ --> $x=3$ or $x=-3$ or $x=4$ or $x=-4$. Four answers, not sufficient.

(1)+(2) Intersection of values from (1) and (2) is $x=4$. Sufficient.

Answer: C.