1. does GCD(a,b) divide a?
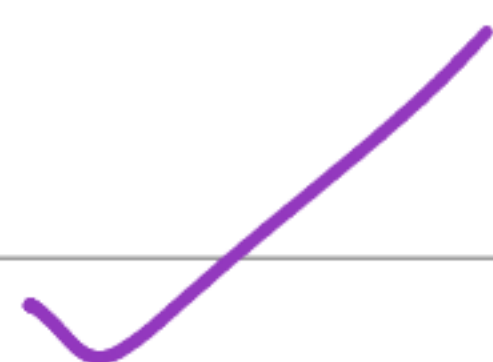
$$\frac{a}{GCD} = \frac{a}{p^{m-2} \times q^n}$$

$$= \frac{p^m \times q^n \times r}{p^{m-2} \times q^n}$$

$$= \left(\frac{p^m}{p^{m-2}}\right) \times \left(\frac{q^n}{q^n}\right) \times r$$

$$= p^2 \times 1 \times r$$
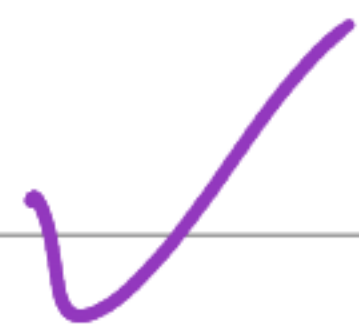
$$= p^2 \times r$$

2. does $GCD(a,b)$ divide b?

$$\frac{b}{GCD} = \frac{b}{p^{m-2} \times q^n} = b$$

$$= \frac{p^{m-2} \times q^{n+2}}{p^{m-2} \times q^n}$$

$$\frac{b}{p^{m-2} \times q^n}$$

$$= \left(\frac{p^{m-2}}{p^{m-2}}\right) \times \left(\frac{q^{n+2}}{q^n}\right)$$

$$= 1 \times q^2$$

$$= q^2$$

✓

3. does a divide $LCM(a,b)$

(:) $\dfrac{LCM(a,b)}{a}$

$= \dfrac{p^m \times q^{n+2} \times r}{a}$

$= \dfrac{p^m \times q^{n+2+r}}{p^n \times q^n \times r}$

$= \left(\dfrac{p^m}{p^n}\right) \times (q^{n+2}) \times \left(\dfrac{r}{r}\right)$

$= 1 \times q^2 \times 1$

$= q^2$

$\dfrac{p^m \times q^{n+2} \times r}{p^m \times q^n \times r}$

$= \dfrac{p^m}{p^m} \times \dfrac{q^{n+2}}{q^n} \times \dfrac{r}{r}$

$= 1 \times q^2 \times 1$

$= q^2$

Write neatly!

$\div$, $\times$ are both looking the same

powers have to be at the top, bases at the bottom

4. does b divide $LCM(a,b)$

$$= \frac{LCM(a,b)}{b}$$

$$= \frac{p^m \times q^{n+2} \times r}{p^{m-2} \times q^{n+2}}$$

$$= \left(\frac{p^m}{p^{m-2}}\right) \times \left(\frac{q^{n+2}}{q^{n+2}}\right) \times r$$

$$= p^2 \times 1 \times r$$

$$= p^2 \times r$$

✓