1) The variable \( p \) varies jointly with \( q \) and \( r \). The value of \( p \) is 792 when \( q = 12 \) and \( r = 6 \).

   a) Write an equation that relates \( p, q \) and \( r \). 

   \[ p = kqr \]

   b) Find the value of \( q \) when \( p = 88 \) and \( r = 2 \). 

   \[ q = \frac{p}{kr} = \frac{88}{12 \cdot 6} = \frac{88}{72} = \frac{11}{9} \]

2) The variable \( u \) varies directly with \( \sqrt{v} \) and inversely with \( w \). The value of \( u \) is \( \frac{1}{4} \) when \( \sqrt{v} = 3 \) and \( w = \frac{4}{5} \).

   a) Write an equation that relates \( u, v \) and \( w \). 

   \[ u = \frac{k\sqrt{v}}{w} \]

   b) Find the value of \( v \) when \( u = 4 \) and \( w = 12 \). 

   \[ v = \left( \frac{uw}{k} \right)^2 = \left( \frac{4 \cdot 12}{k} \right)^2 = \left( \frac{48}{k} \right)^2 \]

3) The variable \( m \) varies inversely with \( n \). The value of \( m \) is \( -8 \) when \( n = -7 \).

   a) Write an equation that relates \( m \) and \( n \). 

   \[ m = \frac{k}{n} \]

   b) Find the value of \( n \) when \( m = 8 \). 

   \[ n = \frac{k}{m} = \frac{8}{k} \]

4) The variable \( z \) varies jointly with \( x \) and \( y \). The value of \( z \) is 63 when \( x = 1 \) and \( y = 9 \).

   a) Write an equation that relates \( x, y \) and \( z \). 

   \[ z = kxy \]

   b) Find the value of \( z \) when \( x = 5 \) and \( y = 4 \). 

   \[ z = kxy = k \cdot 5 \cdot 4 = 20k \]

5) The variable \( g \) varies directly with \( h \) and inversely with \( d \). The value of \( g \) is 35 when \( d = 3 \) and \( h = 21 \).

   a) Write an equation that relates \( d, g \) and \( h \). 

   \[ g = \frac{kh}{d} \]

   b) Find the value of \( d \) when \( g = 15 \) and \( h = 27 \). 

   \[ d = \frac{kh}{g} = \frac{27 \cdot 15}{15} = 27 \]
1) The variable $p$ varies jointly with $q$ and $r$. The value of $p$ is 792 when $q = 12$ and $r = 6$.

   a) Write an equation that relates $p$, $q$ and $r$. 

      $p = 11qr$ 

   b) Find the value of $q$ when $p = 88$ and $r = 2$. 

      $q = 4$ 

2) The variable $u$ varies directly with $\sqrt{v}$ and inversely with $w$. The value of $u$ is $\frac{1}{4}$ when $\sqrt{v} = 3$ and $w = \frac{4}{5}$.

   a) Write an equation that relates $u$, $v$, and $w$. 

      $u = \frac{\sqrt{v}}{15w}$ 

   b) Find the value of $u$ when $v = 4$ and $w = \frac{45}{4}$. 

      $u = \frac{1}{45}$ 

3) The variable $m$ varies inversely with $n$. The value of $m$ is $-8$ when $n = -7$.

   a) Write an equation that relates $m$ and $n$. 

      $m = \frac{56}{n}$ 

   b) Find the value of $n$ when $m = 8$. 

      $n = 7$ 

4) The variable $z$ varies jointly with $x$ and $y$. The value of $z$ is 63 when $x = 1$ and $y = 9$.

   a) Write an equation that relates $x$, $y$ and $z$. 

      $z = 7xy$ 

   b) Find the value of $z$ when $x = 5$ and $y = 4$. 

      $z = 140$ 

5) The variable $g$ varies directly with $h$ and inversely with $d$. The value of $g$ is 35 when $d = 3$ and $h = 21$.

   a) Write an equation that relates $d$, $g$ and $h$. 

      $g = \frac{5h}{d}$ 

   b) Find the value of $d$ when $g = 15$ and $h = 27$. 

      $d = 9$