

A four-digit number  $YEAR$  is called *very good* if the system

$$Yx + Ey + Az + Rw = Y$$

$$Rx + Yy + Ez + Aw = E$$

$$Ax + Ry + Yz + Ew = A$$

$$Ex + Ay + Rz + Yw = R$$

of linear equations in the variables  $x, y, z$  and  $w$  has at least two solutions. Find all very good YEARS in the 21st century.

(The 21st century starts in 2001 and ends in 2100.)