a) $$\overline{x \vee y} = 1-(1-(1-x)(1-y)) = (1-x)(1-y) = 1-x-y+xy$$

b) $$x \vee (y \oplus z) = x \vee y\,\bar{z} \vee \bar{y}\,z = 1-(1-x)(1-y(1-z))(1-(1-y)z) =$$
$$= 1-(1-x)(1-y+yz)(1-z+yz) = 1-(1-x)(1-z+yz-y+yz-y^2z+yz-yz^2+y^2z^2) =$$
$$= 1-(1-x)(1-z+yz-y+yz-yz+yz-yz+yz) = 1-(1-x)(1-y-z+2yz) =$$
$$= 1-(1-y-z+2yz-x+xy+xz-2xyz) = x+y+z-xy-xz-2yz+2xyz$$

c) $$x \vee \bar{y}\,z \vee \bar{x}\,y\,\bar{z} = 1-(1-x)(1-(1-y)z)(1-(1-x)y(1-z)) =$$
$$= 1-(1-x)(1-z+yz)(1-y+xy+yz-xyz) =$$
$$= 1-(1-x)(1-y+xy+yz-xyz-z+yz-xyz-yz^2+xyz^2+yz-y^2z+xy^2z+y^2z^2-xy^2z^2) =$$
$$= 1-(1-x)(1-y+xy+yz-xyz-z+yz-xyz-yz+xyz+yz-yz+xyz+yz-xyz) =$$
$$= 1-(1-x)(1-y-z+xy+2yz-xyz) =$$
$$= 1-1+y+z-xy-2yz+xyz+x-xy-xz+x^2y+2xyz-x^2yz =$$
$$= y+z-xy-2yz+xyz+x-xy-xz+xy+2xyz-xyz = x+y+z-xy-xz-2yz+2xyz$$

Vidi se da je dobijen isti rezultat kao pod b). Ovo je posljedica činjenice da su polazni izrazi pod c) i b) zapravo ekvivalentni. Zaista, imamo:

$$x \vee \bar{y}\,z \vee \bar{x}\,y\,\bar{z} = (x \vee \bar{x}\,y\,\bar{z}) \vee \bar{y}\,z = x \vee y\,\bar{z} \vee \bar{y}\,z = x \vee (y \oplus z)$$

d) $$\overline{xy \vee yz \vee xz} = 1-(1-(1-xy)(1-yz)(1-xz)) =$$
$$= (1-xy)(1-yz)(1-xz) = (1-xy-yz+xy^2z)(1-xz) =$$
$$= (1-xy-yz+xyz)(1-xz) = 1-xy-yz+xyz-xz+x^2yz+xyz^2-x^2yz^2 =$$
$$= 1-xy-yz+xyz-xz+xyz+xyz-xyz = 1-xy-yz-xz+2xyz$$

e) $$\overline{x \oplus y}\;\overline{xy} = (xy \vee \bar{x}\bar{y})\,\overline{xy} = (1-(1-xy)(1-(1-x)(1-y)))(1-xy) =$$
$$= (1-(1-xy)(x+y-xy))(1-xy) = (1-x-y+xy+x^2y+xy^2-x^2y^2)(1-xy) =$$
$$= (1-x-y+xy+xy+xy-xy)(1-xy) = (1-x-y+2xy)(1-xy) =$$
$$= 1-x-y+2xy-xy+x^2y+xy^2-2x^2y^2 = 1-x-y+2xy-xy+xy+xy-2xy =$$
$$= 1-x-y+xy$$

Do istog rezultata se može doći brže i jednostavnije ukoliko se na početku prvo pojednostavi polazni izraz:

$$\overline{x \oplus y}\;\overline{xy} = (xy \vee \bar{x}\bar{y})\,\overline{xy} = (xy \vee \bar{x}\bar{y})(\bar{x} \vee \bar{y}) = \bar{x}\bar{y} \vee \bar{x}\bar{y} = \bar{x}\bar{y} =$$
$$= (1-x)(1-y) = 1-x-y+xy$$

f) $$(xy \vee z)(\bar{z} \vee xz) = (1-(1-xy)(1-z))(1-z(1-xz)) =$$
$$= (1-1+z+xy-xyz)(1-z+xz^2) = (z+xy-xyz)(1-z+xz) =$$
$$= z-z^2+xz^2+xy-xyz+x^2yz-xyz+xyz^2-x^2yz^2 =$$
$$= z-z+xz+xy-xyz+xyz-xyz+xyz-xyz = xy+xz-xyz$$

Alternativno, postupak se može skratiti uz prethodno pojednostavljivanje polaznog izraza:

$$(xy \vee z)(\bar{z} \vee xz) = (xy \vee z)(x \vee \bar{z}) = xy \vee xy\bar{z} \vee xz = xy \vee xz =$$
$$= x(y \vee z) = x(1-(1-y)(1-z)) = x(y+z-yz) = xy+xz-xyz$$

g)
$$\bar{x}\,y \vee \overline{x\,\bar{z} \vee \bar{y}\,z} = 1-(1-(1-x)\,y)\,(1-(1-x\,(1-z))\,(1-(1-y)\,z)) =$$
$$= 1-(1-y+xy)\,(1-(1-x+xz)\,(1-z+yz)) =$$
$$= 1-(1-y+xy)\,(1-1+z-yz+x-xz+xyz-xz+xz^2-xyz^2) =$$
$$= 1-(1-y+xy)\,(z-yz+x-xz+xyz-xz+xz-xyz) = 1-(1-y+xy)\,(x+z-xz-yz) =$$
$$= 1-x-z+xz+yz+xy+yz-xyz-y^2z-x^2y-xyz+x^2yz+xy^2z =$$
$$= 1-x-z+xz+yz+xy+yz-xyz-yz-xy-xyz+xyz+xyz = 1-x-z+xz+yz$$

Alternativno, mogli smo na početku prvo pojednostaviti izraz koliko je god to moguće, čime bismo imali više predradnji, ali bi kasniji postupak bio kraći i jednostavniji:

$$\bar{x}\,y \vee \overline{x\,\bar{z} \vee \bar{y}\,z} = \bar{x}\,y \vee \overline{x\,\bar{z}}\;\overline{\bar{y}\,z} = \bar{x}\,y \vee (\bar{x} \vee z)\,(y \vee \bar{z}) = \bar{x}\,y \vee \bar{x}\,y \vee \bar{x}\,\bar{z} \vee y\,z =$$
$$= \bar{x}\,y \vee \bar{x}\,\bar{z} \vee y\,z = \bar{x}\,y\,(z \vee \bar{z}) \vee \bar{x}\,\bar{z} \vee y\,z = \bar{x}\,y\,z \vee \bar{x}\,y\,\bar{z} \vee \bar{x}\,\bar{z} \vee y\,z =$$
$$= (\bar{x}\,y\,z \vee y\,z) \vee (\bar{x}\,y\,\bar{z} \vee \bar{x}\,\bar{z}) = y\,z \vee \bar{x}\,\bar{z} = 1-(1-yz)\,(1-(1-x)\,(1-z)) =$$
$$= 1-(1-yz)\,(x+z-xz) = 1-x-z+xz+xyz+yz^2-xyz^2 =$$
$$= 1-x-z+xz+xyz+yz-xyz = 1-x-z+xz+yz$$

h)
$$(x \vee y \vee z)\,(x \vee \bar{y} \vee z) = (1-(1-x)\,(1-y)\,(1-z))\,(1-(1-x)\,y\,(1-z)) =$$
$$= (1-(1-x-y+xy)\,(1-z))\,(1-(y-xy)\,(1-z)) =$$
$$= (1-1+x+y-xy+z-xz-yz+xyz)\,(1-y+yz+xy-xyz) =$$
$$= (x+y+z-xy-xz-yz+xyz)\,(1-y+xy+yz-xyz) =$$
$$= x-xy+x^2y+xyz-x^2yz+y-y^2+xy^2+y^2z-xy^2z+z-yz+xyz+yz^2-$$
$$-xyz^2-xy+xy^2-x^2y^2-xy^2z+x^2y^2z-xz+xyz-x^2yz-xyz^2+x^2yz^2-$$
$$-yz+y^2z-xy^2z-y^2z^2+xy^2z^2+xyz-xy^2z+x^2y^2z+xy^2z^2-x^2y^2z^2 =$$
$$= x-xy+xy+xyz-xyz+y-y+xy+yz-xyz+z-yz+xyz+yz-xyz-xy+xy-xy-xyz+$$
$$+xyz-xz+xyz-xyz-xyz+xyz-yz+yz-xyz-yz+xyz+xyz-xyz+xyz+xyz-xyz =$$
$$= x+z-xz$$

Postupak se može drastično pojednostaviti i skratiti ukoliko se prethodno pojednostavi polazni izraz, kao što je urađeno u sljedećem postupku:

$$(x \vee y \vee z)\,(x \vee \bar{y} \vee z) = ((x \vee z) \vee y)\,((x \vee z) \vee \bar{y}) = x \vee z \vee y\,\bar{y} = x \vee z \vee 0 = x \vee z =$$
$$= 1-(1-x)\,(1-z) = x+z-xz$$

i)
$$\overline{x\,y \vee \bar{z}} \vee \overline{x \vee \overline{y\,z}} = 1-(1-(1-xy)\,z)\,(1-(1-x)\,yz) =$$
$$= 1-(1-z+xyz)\,(1-yz+xyz) = 1-1+yz-xyz+z-yz^2+xyz^2-xyz+xy^2z^2-x^2y^2z^2 =$$
$$= yz-xyz+z-yz+xyz-xyz+xyz-xyz = z-xyz$$

I u ovom slučaju ukoliko se prethodno izvrši pojednostavljenje polaznog izraza moguće je osjetno skratiti kasniji tok postupka:

$$\overline{x\,y \vee \bar{z}} \vee \overline{x \vee \overline{y\,z}} = \overline{x\,y}\,z \vee \bar{x}\,y\,z = (\bar{x} \vee \bar{y})\,z \vee \bar{x}\,y\,z = \bar{x}\,z \vee \bar{y}\,z \vee \bar{x}\,y\,z = \bar{x}\,z \vee \bar{y}\,z =$$
$$= (\bar{x} \vee \bar{y})\,z = (1-xy)\,z = z-xyz$$