All Solutions

3 **Applicative Order**

$$(\lambda w.\,w)\;(\underline{(\lambda xy.\,y)\;(z\;z)})$$
$$\to_\beta \underline{(\lambda w.\,w)\;(\lambda y.\,y)}$$
$$\to_\beta \lambda y.\,y$$

Normal Order

$$\underline{(\lambda w.\,w)\;((\lambda xy.\,y)\;(z\;z))}$$
$$\to_\beta \underline{(\lambda xy.\,y)\;(z\;z)}$$
$$\to_\beta \lambda y.\,y$$

Applicative Order

$$\underline{(\lambda xy.\,x)\;(\lambda z.\,y\;z)}$$
$$\to_\beta \lambda y'.\,\lambda z.\,y\;z$$

Normal Order

$$\underline{(\lambda xy.\,x)\;(\lambda z.\,y\;z)}$$
$$\to_\beta \lambda y'.\,\lambda z.\,y\;z$$

Applicative Order

$$\lambda z.\,\underline{(\lambda x.\,x\;z\;y)\;(\lambda xy.\,y\;z)}$$
$$\to_\beta \lambda z.\,\underline{(\lambda xy.\,y\;z)\;z\;y}$$
$$\to_\beta \lambda z.\,\underline{(\lambda y.\,y\;z)\;y}$$
$$\to_\beta \lambda z.\,y\;z$$

Normal Order

$$\lambda z.\,\underline{(\lambda x.\,x\;z\;y)\;(\lambda xy.\,y\;z)}$$
$$\to_\beta \lambda z.\,\underline{(\lambda xy.\,y\;z)\;z\;y}$$
$$\to_\beta \lambda z.\,\underline{(\lambda y.\,y\;z)\;y}$$
$$\to_\beta \lambda z.\,y\;z$$

Applicative Order

$$\lambda xy.\,y\;(\lambda w.\,w)\;(\lambda yz.\,y\;x)$$
$$= \lambda xy.\,(y\;(\lambda w.\,w))\;(\lambda yz.\,y\;x)$$

Normal Order

$$\lambda xy.\,y\;(\lambda w.\,w)\;(\lambda yz.\,y\;x)$$
$$= \lambda xy.\,(y\;(\lambda w.\,w))\;(\lambda yz.\,y\;x)$$