1. (d)

$$\frac{dJ}{d\theta} = -(1/n) \sum_i \{ y^i (1/\sigma(z)) . \sigma(z) . (1-\sigma(z)) (x^i)^T$$
$$- (1-y^i)(1/(1-\sigma(z)) (-\sigma(z)) (1-\sigma(z))(x^i)^T \}$$

$$= -(1/n) \sum_i \{ y^i (1-\sigma(z)) (x^i)^T - (1-y^i) \sigma(z) (x^i)^T \}$$

$$= -(1/n) \sum_i (y^i - \sigma(z)) (x^i)^T$$

where $z = \theta (x^i)^T$.

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