Indicate whether true (+) or false (o):
___ 1. A function which has more than one local minimum cannot be convex.
___ 2. The Hessian matrix evaluated at a local minimum must be positive semidefinite.
___ 5. Newton’s method with linesearch for minimization requires the computation of second partial derivatives.
___ 7. Two successive directions used by Newton’s method will be orthogonal (perpendicular).
___ 8. Two successive directions used by the steepest descent method will be orthogonal (perpendicular).
___ 9. If minimizing a quadratic function of n variables, Newton’s method will require n iterations.
___ 10. If minimizing a quadratic function of n variables, the steepest descent method will require no more than n iterations.

Match the formula used by the algorithms below for computing the search direction from \( x^t \) at iteration \( t \).
___ 11. Newton’s method
___ 12. Steepest Descent method
___ 13. Conjugate gradient (Fletcher-Powell) method
___ 14. Davidon-Fletcher-Powell (Quasi-Newton) method

a. \( d^t = \nabla f \left( x^t \right) \)

b. \( d^t = - \left[ \nabla^2 f \left( x^t \right) \right]^2 \nabla f \left( x^t \right) \)

c. \( d^t = - \nabla f \left( x^t \right) + \frac{\left\| \nabla f \left( x^{t-1} \right) \right\|^2}{\nabla f \left( x^{t-1} \right)} d^{t-1} \)

d. \( d^t = \left[ \nabla^2 f \left( x^t \right) \right] \nabla f \left( x^t \right) \)

e. \( d^t = - \left[ \nabla^2 f \left( x^t \right) \right]^{-1} \nabla f \left( x^t \right) \)

f. \( d^t = -Q \nabla f \left( x^t \right) \)

g. \( d^t = - \nabla f \left( x^t \right) \)

h. \( d^t = \nabla f \left( x^t \right) + d^{t-1} \)

i. \( d^t = - \frac{\left\| \nabla f \left( x^t \right) \right\|^2}{\nabla f \left( x^{t-1} \right)} \nabla f \left( x^t \right) \)