6-3)

The question is not concerned about the actual throwing of the stone, but only in what happens after it leaves the hand.
W = 20N -> m = W/g = 2 kg

a)
From launch to 15 m up:

After the rock leaves the hand, only the weight acts on it. The weight and the displacement are in opposite directions.

$W_{TOT} = \Delta K$

$gm\ h \cos(180^o) = {}^1/_2 m v_f^2 - {}^1/_2 m v_i^2$
$-gmh = {}^1/_2 m v_f^2 - {}^1/_2 m v_i^2$
$v_i = [v_f^2 + 2gh]^{1/2} = [25^2 + 2*10*15]^{1/2} =$ 30.4 m/s

b)

From the launch to the top:

$gm\ h_{MAX} \cos(180^o) = {}^1/_2 m v_f^2 - {}^1/_2 m v_i^2$ ($v_f = 0$)
$-gm\ h_{MAX} = - {}^1/_2 m v_i^2$
$h_{MAX} = v_i^2 / 2g =$ 46.2m above the starting point.