

RANGE OF A SHOT PUT

The range of a shot put can be worked out from this complex-looking formula:

$$R = \frac{v^2}{2g} \left(1 + \sqrt{1 + \frac{2gy_0}{v^2 \sin^2 \theta}} \right) \sin 2\theta,$$

where:

R is the range of the shot put;

v is the speed of the shot put when released;

g is the acceleration due to gravity;

θ is the angle relative to the horizontal of the shot put when it is released;

y_0 is the height above the ground at which the shot put is released;

If gravity is the only thing that changes, then the range increases roughly as I indicated on page 168. In reality, in lower gravity it should be possible to release the shot at a higher speed (the shot will feel less heavy, so you can push it faster). This will *increase* the range, so my estimate of the advantage of Mexico City is on the low side.