

The centripetal force equals  $F = ma_c = mr\omega^2 = \frac{mv^2}{r}$ .

- a) If the rock will 8 times lighter, than its mass will equal:  $\frac{m}{8}$ . So, we can find the centripetal force in

this case:  $F_1 = \frac{m}{8} \cdot \frac{v^2}{r} = \frac{1}{8} \cdot \frac{mv^2}{r} = \frac{1}{8} \cdot F$ . So, the centripetal force will be lower in 8 times than

it was if the rock will 8 times lighter.

Answer: lower in 8 times.

- b) If the rock will swung 7 times faster than its velocity will be equal  $7 \cdot v$ . So, we can find the

centripetal force in this case:  $F_2 = \frac{m(7v)^2}{r} = 49 \cdot \frac{mv^2}{r} = 49 \cdot F$ . so, it will be greater in 49

times.

Answer: greater in 49 times.

- c) If the sling will be 6 times longer than the radius of this circular motion will be 6 times greater and

equals  $6 \cdot r$ . So, we can find the centripetal force in this case:  $F_3 = \frac{mv^2}{(6 \cdot r)} = \frac{1}{6} \cdot \frac{mv^2}{r} = \frac{1}{6} \cdot F$ .

So, it will be 6 times lower.

Answer: lower in 6 times.