Rolling...

- We have two equations:
$$Mg\ sin\ \theta - f = Ma$$

$$f = I\frac{a}{R^2}$$

- We can combine these to eliminate f:

$$a = g\left(\frac{MR^2 \sin\theta}{MR^2 + I}\right)$$

For a sphere:

$$a = g\left(\frac{MR^2 \sin\theta}{MR^2 + \frac{2}{5}MR^2}\right) = \frac{5}{7}g\sin\theta$$

I

A

M R

θ