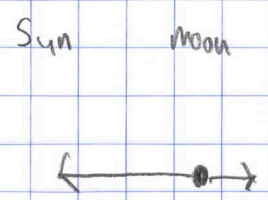
$F = G\frac{m_1 m_2}{d^2}$ $G = 6.67 \cdot 10^{-11}$

Alex Keah

	Mass	Distance
Earth	$5.972 \cdot 10^{24}$	$3.844 \cdot 10^{9}$ m
Moon	$7.348 \cdot 10^{22}$	$1.5 \cdot 10^{11}$ m
Sun	$1.989 \cdot 10^{30}$	

Solar eclipse



Lunar Eclipse

force of sun on moon

$$F = 6.67 \cdot 10^{-11} \cdot \left(\frac{1.989 \cdot 10^{30} \cdot 7.348 \cdot 10^{22}}{(1.5 \cdot 10^{11})^2}\right) = 4.33 \cdot 10^{20} \text{ N}$$

force of earth on moon

$$F = 6.67 \cdot 10^{-11} \left(\frac{5.972 \cdot 10^{24} \cdot 7.348 \cdot 10^{22}}{(1.5 \cdot 10^{11})^2}\right) = 1.98 \cdot 10^{20}$$

Solar eclipse

$4.33 \cdot 10^{20} + (-1.98 \cdot 10^{20}) = 2.35 \cdot 10^{20}$ N

Lunar eclipse

$4.33 \cdot 10^{20} + 1.98 \cdot 10^{20} = 6.31 \cdot 10^{20}$ N

The moon would have the greatest net force during the lunar eclipse with a force of $6.31 \cdot 10^{20}$ N acting on it.