

|            |        |          |          |          |          |          |          |          |          |          |          |          |          |          |              |              |              |              |              |              |         |  |
|------------|--------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------------|--------------|--------------|--------------|--------------|--------------|---------|--|
| Fy.uppgift |        | 1        | 2        | 3        | 4        | 5        | 6        | 7        | 8        | 9        | 10       | 11       | 12       | 13       | 14           | 15           | 16           | 17           | 18           | 19           | 20      |  |
| svarsform  |        | AB<br>CD | AB<br>CD | AB<br>CD | AB<br>CD | AB<br>CD | AB<br>CD | AB<br>CD | AB<br>CD | AB<br>CD | AB<br>CD | AB<br>CD | AB<br>CD | AB<br>CD | kort<br>svar | kort<br>svar | kort<br>svar | kort<br>svar | kort<br>svar | kort<br>svar | Lösning |  |
| Ma/Fy      | CTHKTH |          |          |          |          |          |          |          |          | D        |          |          |          |          |              |              |              |              |              |              |         |  |
| 2024       | SU     | GU       |          |          |          |          |          |          |          |          |          |          |          |          |              |              |              |              |              |              |         |  |

9. Om jordens radie var dubbelt så stor (med samma densitet), hur stor skulle tyngdaccelerationen vid jordytan vara?

- A.  $\frac{g}{4}$     B.  $\frac{g}{2}$     C.  $g$     D.  $2g$

9. Om jordens radie var dubbelt så stor (med samma densitet), hur stor skulle tyngdaccelerationen vid jordytan vara?

- A.  $\frac{g}{4}$   
B.  $\frac{g}{2}$   
C.  $g$   
D.  $2g$

|                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>jorden som sitt gamla original (ovan)</p> <p>Den gamla radien: <math>r</math></p> <p>Den gamla volymen: <math>V_{\text{gamal}} = \frac{4\pi r^3}{3}</math></p> <p>och <math>M_{\text{gamal}} = V_{\text{gamal}} \cdot \rho</math></p> $g = G \cdot \frac{M_{\text{jord}}}{r^2}$ |  <p>Den nya radien: <math>2r</math></p> <p>Den nya massan (samma densitet):</p> $M_{\text{ny}} = V_{\text{ny}} \cdot \rho$ $V_{\text{ny}} = \frac{4\pi(2r)^3}{3} = 8 \cdot V_{\text{gamal}}$ <p>Detta ger <math>M_{\text{ny}} = 8 \cdot M_{\text{gamal}}</math></p> | $F = G \cdot \frac{m_1 \cdot m_2}{r^2}$ <p>allmänna gravitationslagen</p> <p>jämför <math>F = m \cdot g</math></p> <p>Låt <math>m_1 = m</math> och <math>m_2 = M_{\text{jord}}</math></p> <p>där <math>g</math> då kommer ifrån</p> $g_{\text{gamal}} = G \cdot \frac{M_{\text{jord}}}{r^2}$ <p>där <math>g</math> då kommer ifrån</p> $g_{\text{ny}} = G \cdot \frac{8 \cdot M_{\text{jord}}}{(2r)^2}$ $g_{\text{ny}} = G \cdot \frac{8 \cdot M_{\text{jord}}}{4r^2}$ $g_{\text{ny}} = 2 \cdot g_{\text{gamal}}$ <p>alltså alternativ D.</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|