2. Bez Kreisberechnungen Lösungen AB 1

1. Berechne den Umfang (u) und die Fläche (A) von Kreisen mit folgenden Angaben.

a) $u = 2r\pi = \underline{\underline{75cm}}$ $A = r^2\pi = \underline{\underline{452cm^2}}$

b) $u = 2r\pi = \underline{\underline{19m}}$ $A = r^2\pi = \underline{\underline{28{,}3m^2}}$

c) $u = 2r\pi = \underline{\underline{2871cm}}$ $A = r^2\pi = \underline{\underline{65{,}6m^2}}$

d) $u = 2r\pi = \underline{\underline{61{,}3km}}$ $A = r^2\pi = \underline{\underline{299km^2}}$

e) $u = 2r\pi = \underline{\underline{3{,}14m}}$ $A = r^2\pi = \underline{\underline{0{,}8m^2}}$

f) $u = 2r\pi = \underline{\underline{785m}}$ $A = r^2\pi = \underline{\underline{4{,}9ha}} = \underline{\underline{490a}} = \underline{\underline{49'000m^2}}$

g) $u = d\pi = \underline{\underline{5{,}3km}}$ $A = \left(\frac{d}{2}\right)^2\pi = r^2\pi = \underline{\underline{2{,}2km^2}}$

h) $u = d\pi = \underline{\underline{1{,}6m}}$ $A = \left(\frac{d}{2}\right)^2\pi = r^2\pi = \underline{\underline{21{,}2dm^2}}$

i) $u = d\pi = \underline{\underline{3{,}9cm}}$ $A = \left(\frac{d}{2}\right)^2\pi = r^2\pi = \underline{\underline{121mm^2}} = \underline{\underline{1{,}21cm^2}}$

j) $u = d\pi = \underline{\underline{113m}}$ $A = \left(\frac{d}{2}\right)^2\pi = r^2\pi = \underline{\underline{10a}} = \underline{\underline{1'000m^2}}$

k) $u = d\pi = \underline{\underline{44{,}9dm}}$ $A = \left(\frac{d}{2}\right)^2\pi = r^2\pi = \underline{\underline{160{,}6dm^2}}$

l) $u = d\pi = \underline{\underline{3{,}77dm}}$ $A = \left(\frac{d}{2}\right)^2\pi = r^2\pi = \underline{\underline{1{,}13dm^2}}$

2. $u = d\pi$ $d = \frac{u}{\pi}$ $r = \frac{u}{2\pi}$

a) $d = \frac{u}{\pi} = \underline{\underline{392{,}8m}}$ $r = \frac{u}{2\pi} = \underline{\underline{196{,}4m}}$

b) $d = \frac{u}{\pi} = \underline{\underline{127{,}3m}}$ $r = \frac{u}{2\pi} = \underline{\underline{63{,}7m}}$

c) $d = \frac{u}{\pi} = \underline{\underline{1{,}36cm}}$ $r = \frac{u}{2\pi} = \underline{\underline{6{,}8mm}}$

d) $d = \frac{u}{\pi} = \underline{\underline{0{,}57mm}}$ $r = \frac{u}{2\pi} = \underline{\underline{0{,}29mm}}$

e) $d = \frac{u}{\pi} = \underline{\underline{200m}}$ $r = \frac{u}{2\pi} = \underline{\underline{100m}}$

f) $d = \frac{u}{\pi} = \underline{\underline{3{,}5m}}$ $r = \frac{u}{2\pi} = \underline{\underline{1{,}75m}}$

g) $d = \frac{u}{\pi} = \underline{\underline{0{,}32m}}$ $r = \frac{u}{2\pi} = \underline{\underline{0{,}16m}}$

h) $d = \frac{u}{\pi} = \underline{\underline{1km}}$ $r = \frac{u}{2\pi} = \underline{\underline{500m}}$

i) $d = \frac{u}{\pi} = \underline{\underline{27{,}9cm}}$ $r = \frac{u}{2\pi} = \underline{\underline{13{,}9cm}}$

j) $d = \frac{u}{\pi} = \underline{\underline{3{,}8m}}$ $r = \frac{u}{2\pi} = \underline{\underline{1{,}9m}}$

k) $d = \frac{u}{\pi} = \underline{\underline{807{,}4m}}$ $r = \frac{u}{2\pi} = \underline{\underline{403{,}7m}}$

l) $d = \frac{u}{\pi} = \underline{\underline{63{,}7cm}}$ $r = \frac{u}{2\pi} = \underline{\underline{31{,}8cm}}$

3. Der Erdradius wird mit r = 6378,39km angegeben.

   a) Wie gross ist der Äquatorumfang?

   $u = 2r\pi = \underline{40'077km}$

   b) Wie gross ist die Schnittfläche durch den Globus am Äquator?

   $A = r^2\pi = 127'812'112km^2 = \underline{1{,}278 \cdot 10^8 km^2}$

   c) Wie gross wäre der Erdradius, wenn der Äquatorumfang mit 40'000km angegeben wird?

   $r = \frac{u}{2\pi} = \underline{6366km}$

4. Der Mondumfang beträgt 10'920,2km.

   a) Berechne den Mondradius.

   $r = \frac{u}{2\pi} = \underline{1738km}$

   b) Wie viel Prozent beträgt der Mondradius im Vergleich zum Erdradius? (siehe Nr.3)

   $r = \frac{u}{2\pi} = 6378{,}39km \mathrel{\widehat{=}} 100\%$

   $r = \frac{u}{2\pi} = 1738km \mathrel{\widehat{=}} \frac{1738}{6378{,}39} = 27{,}25\%$

   Der Radius ist um <u>72,75% kleiner</u>.

5. Der Umfang eines Kreises betrage folgende Grössen. Wie gross ist jeweils die Kreisfläche?

   a) $A = \left(\frac{u}{2\pi}\right)^2 \pi = \underline{4{,}293m^2}$ $\quad r = \frac{u}{2\pi} = 1{,}169 \ldots m$

   b) $A = \left(\frac{u}{2\pi}\right)^2 \pi = \underline{718{,}5km^2}$ $\quad r = \frac{u}{2\pi} = 15{,}123 \ldots km$

   c) $A = \left(\frac{u}{2\pi}\right)^2 \pi = \underline{0{,}045m^2} = \underline{4{,}5dm^2}$ $\quad r = \frac{u}{2\pi} = 0{,}119 \ldots m$

   d) $A = \left(\frac{u}{2\pi}\right)^2 \pi = \underline{5{,}304m^2}$ $\quad r = \frac{u}{2\pi} = 129{,}934 \ldots cm$