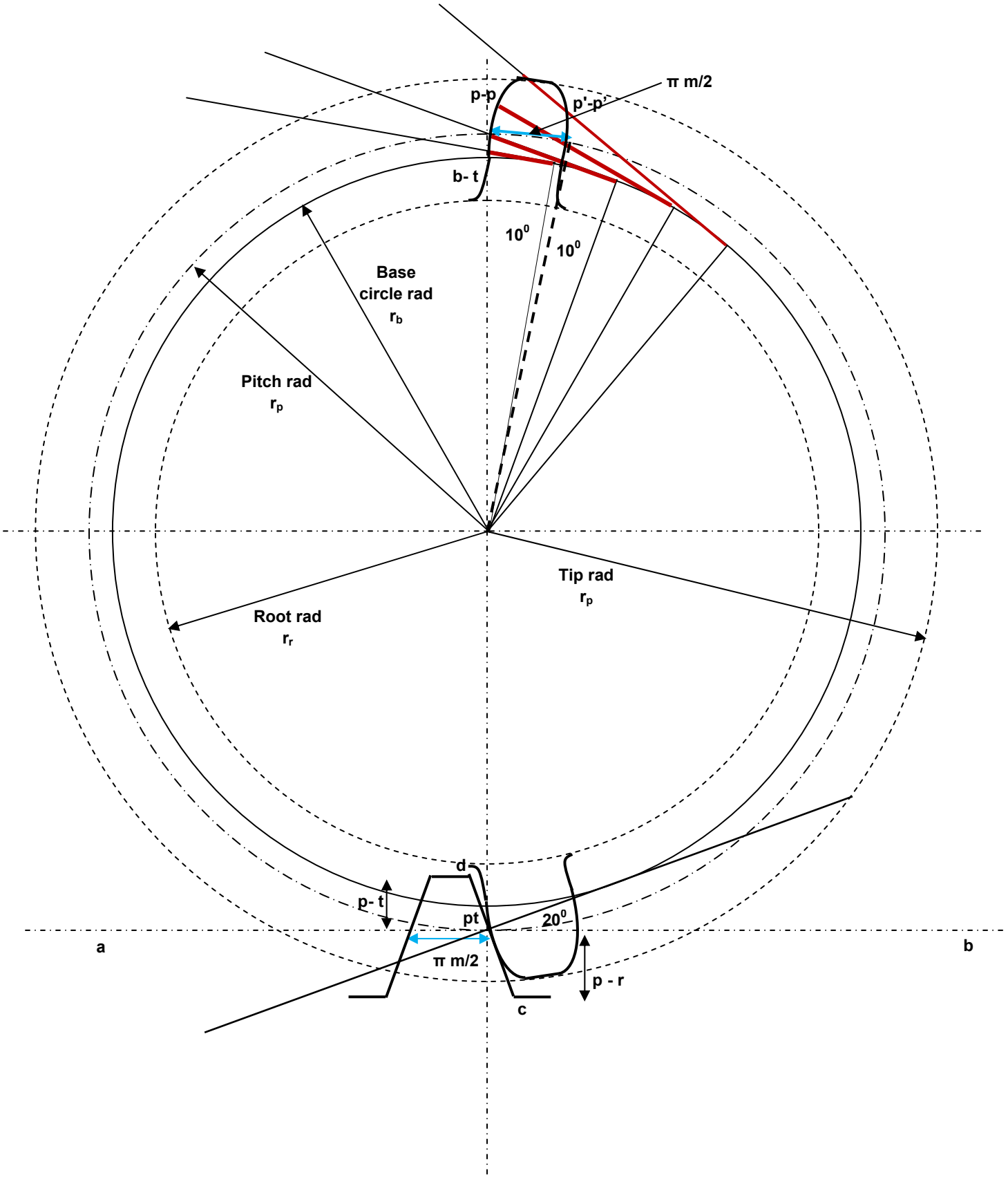
π m/2
p-p
p'-p'
b- t
10⁰
10⁰
Base
circle rad
r_b
Pitch rad
r_p
Tip rad
r_p
Root rad
r_r
d
p- t
pt
20⁰
a
b
π m/2
p - r
c

RACK AND PINION

Z=15, m=8, $\phi = 20^0$, af= 1, df=1.25

dp= PCD= z x m , db=base circle = PCD x cos ϕ, tip=dt= (z+2af) x m, root= dr = (z- 2df) x m

1. Draw circles for PCD, base, tip and root.
2. Draw the involute profile p-p as shown. At a distance $\pi m/2$ along the pitch circle draw a mirror image of p-p as p'-p'. draw an extension line b-t from base to tip circle. Complete the tooth profile.
3. At pt below draw a line a-b. Draw a line c-d at 20 degree with the vertical. Complete the rack profile as shown. p-t means pitch to tip distance and p-r means pitch to root distance.
4. Draw an inclined line at 20 degree through the point pt to denote pressure angle.
5. Copy the earlier drawn teeth to touch the rack at pitch point pt.
6. complete for three profiles.