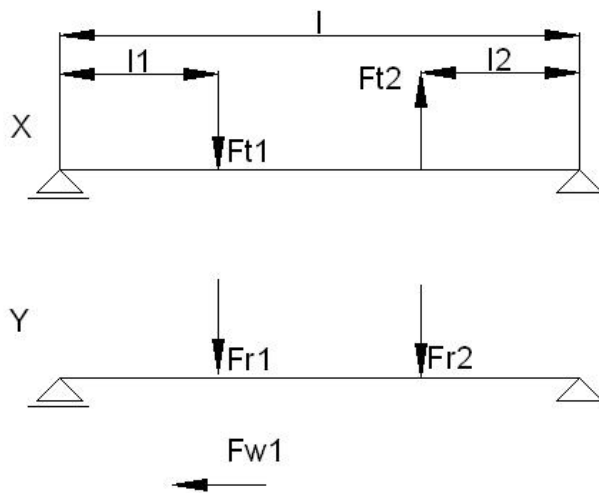
 <p>The image contains two free body diagrams of a shaft. The top diagram, labeled 'X', shows the shaft in a horizontal plane with a left support and a right support. A tangential force F_{t1} acts downwards at a distance l_1 from the left support. A tangential force F_{t2} acts upwards at a distance l_2 from the right support. The total length of the shaft is l. The bottom diagram, labeled 'Y', shows the shaft in a vertical plane. It has the same supports and radial forces F_{r1} and F_{r2} acting downwards at the same positions. Additionally, a horizontal force F_{w1} acts to the left at the left support.</p>	<p>Student: Badiane Lamine</p> <p>Problem nr: 1</p> <p>Determine the dimensions of the shaft if it is made of steel C45 ($k_{go}=80\text{MPa}$, $k_{gj}=125\text{MPa}$, $k_{so}=45\text{MPa}$, $k_{sj}=85\text{MPa}$). The shaft transfers the torque $T= 152\text{Nm}$</p> <p>Additional assumption: variable direction of rotation of gears. The shaft dimensions defined in the drawing are as follows: $l_1=60\text{mm}$; $l_2=80\text{mm}$; $l=200\text{mm}$</p> <p>The dimensions of the gears are as follows: $D_1=200\text{mm}$, $D_2=150\text{mm}$</p> <p>The force values are as follows: $F_{t1}=1520\text{N}$; $F_{r1}=553\text{N}$; $F_{w1}=200\text{N}$ $F_{t2}=2026\text{N}$; $F_{r2}=737\text{N}$</p>
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<p>The image contains two free body diagrams of a shaft. The top diagram, labeled 'X', shows the shaft in the horizontal plane. It has a pin support at the left end. A downward force F_{t1} is applied at a distance l_1 from the left end. An upward force F_{t2} is applied at a distance l_2 from the right end. The total length of the shaft is l. The bottom diagram, labeled 'Y', shows the shaft in the vertical plane. It has a pin support at the left end. A downward force F_{r1} is applied at a distance l_1 from the left end. A downward force F_{r2} is applied at a distance l_2 from the right end. A horizontal force F_{w1} is applied at the left end, pointing to the left.</p>	<p>Student: Kamiloğlu Eylül Bahar</p> <p>Problem nr: 2</p> <p>Determine the dimensions of the shaft if it is made of steel C55 ($k_{go}=90\text{MPa}$, $k_{gj}=140\text{MPa}$, $k_{so}=50\text{MPa}$, $k_{sj}=95\text{MPa}$). The shaft transfers the torque $T= 127\text{Nm}$</p> <p>Additional assumption: variable direction of rotation of gears. The shaft dimensions defined in the drawing are as follows: $l_1=66\text{mm}$; $l_2=88\text{mm}$; $l=220\text{mm}$</p> <p>The dimensions of the gears are as follows: $D_1=250\text{mm}$, $D_2=150\text{mm}$</p> <p>The force values are as follows: $F_{t1}=1016\text{N}$; $F_{r1}=369\text{N}$; $F_{w1}=300\text{N}$ $F_{t2}=1693\text{N}$; $F_{r2}=616\text{N}$</p>
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Student: Mohamed Mohanad Adel
Abdelazeem

Problem nr: 3

Determine the dimensions of the shaft if it is made of steel C25 ($k_{go}=65\text{MPa}$, $k_{gj}=100\text{MPa}$, $k_{so}=35\text{MPa}$, $k_{sj}=70\text{MPa}$).

The shaft transfers the torque $T= 119\text{Nm}$

Additional assumption: constant rotation direction. The shaft dimensions defined in the drawing are as follows: $l_1=72\text{mm}$; $l_2=96\text{mm}$; $l=240\text{mm}$

The dimensions of the gears are as follows:

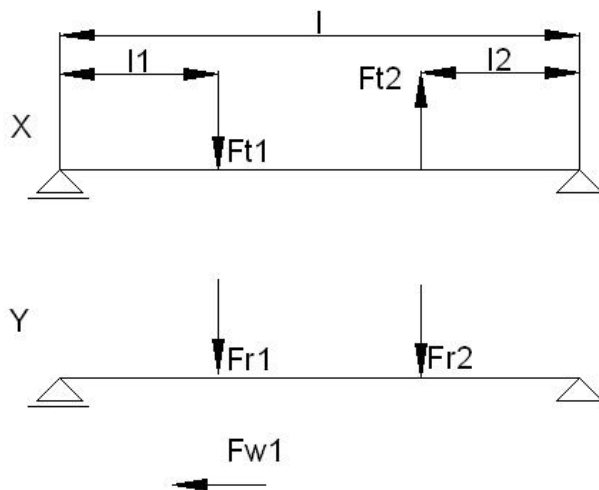
$D_1=300\text{mm}$, $D_2=200\text{mm}$

The force values are as follows:

$F_{t1}=793\text{N}$; $F_{r1}=288\text{N}$; $F_{w1}=250\text{N}$

$F_{t2}=1190\text{N}$; $F_{r2}=433\text{N}$

<p>The image contains two free-body diagrams of a shaft. The top diagram, labeled 'X', represents the shaft in the horizontal plane. It shows a horizontal line representing the shaft with two supports at the ends. A tangential force F_{t1} acts downwards at a distance l_1 from the left support. A tangential force F_{t2} acts upwards at a distance l_2 from the right support. The total length of the shaft is l. The bottom diagram, labeled 'Y', represents the shaft in the vertical plane. It shows a horizontal line with two supports. A radial force F_{r1} acts downwards at a distance l_1 from the left support. A radial force F_{r2} acts downwards at a distance l_2 from the right support. A horizontal force F_{w1} acts to the left at the left support.</p>	<p>Student: Muhala Norman Tawanda</p> <p>Problem nr: 4</p> <p>Determine the dimensions of the shaft if it is made of steel C35 ($k_{go}=70\text{MPa}$, $k_{gj}=110\text{MPa}$, $k_{so}=40\text{MPa}$, $k_{sj}=75\text{MPa}$). The shaft transfers the torque $T= 95\text{Nm}$</p> <p>Additional assumption: constant rotation direction. The shaft dimensions defined in the drawing are as follows: $l_1=78\text{mm}$; $l_2=104\text{mm}$; $l=260\text{mm}$</p> <p>The dimensions of the gears are as follows: $D_1=350\text{mm}$, $D_2=250\text{mm}$</p> <p>The force values are as follows: $F_{t1}=542\text{N}$; $F_{r1}=197\text{N}$; $F_{w1}=400\text{N}$ $F_{t2}=760\text{N}$; $F_{r2}=276\text{N}$</p>
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Student: Naili Amin

Problem nr: 5

Determine the dimensions of the shaft if it is made of steel C55 ($k_{go}=90\text{MPa}$,

$k_{gj}=140\text{MPa}$, $k_{so}=50\text{MPa}$, $k_{sj}=95\text{MPa}$).

The shaft transfers the torque $T=114\text{Nm}$

Additional assumption: variable direction of rotation of gears. The shaft dimensions

defined in the drawing are as follows:

$l_1=84\text{mm}$; $l_2=112\text{mm}$; $l=280\text{mm}$

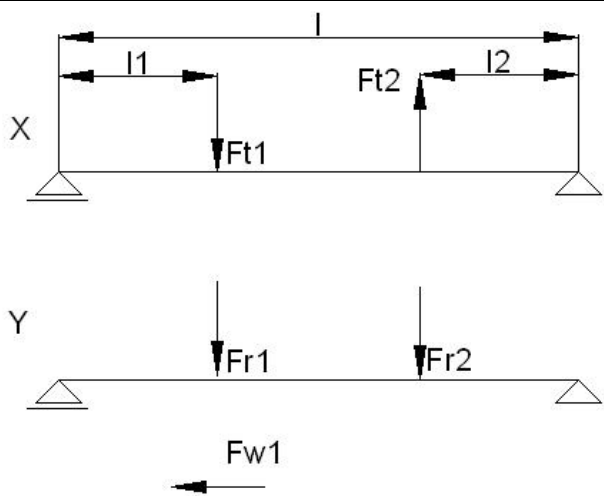
The dimensions of the gears are as follows:

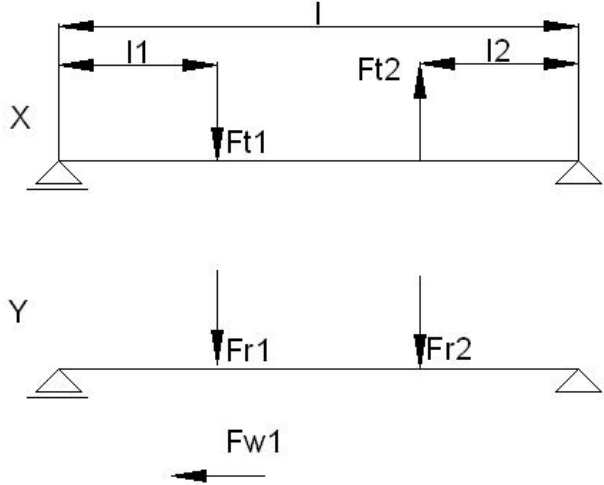
$D_1=400\text{mm}$, $D_2=250\text{mm}$

The force values are as follows:

$F_{t1}=570\text{N}$; $F_{r1}=207\text{N}$; $F_{w1}=500\text{N}$

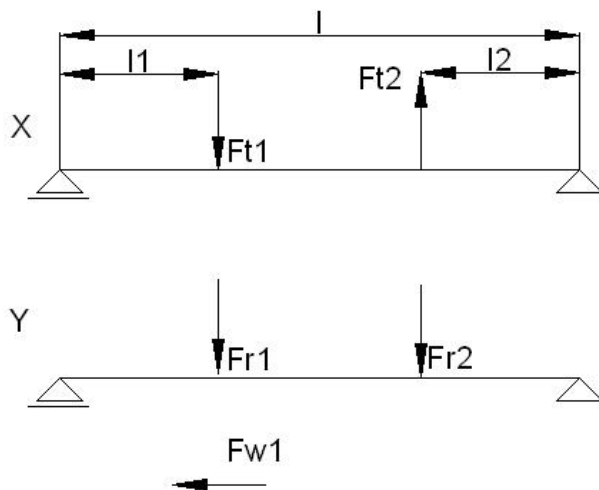
$F_{t2}=912\text{N}$; $F_{r2}=331\text{N}$

 <p>The image contains two free body diagrams of a shaft. The top diagram, labeled 'X', shows the shaft in a horizontal plane with a left support and a right support. A tangential force F_{t1} acts downwards at a distance l_1 from the left support. A tangential force F_{t2} acts upwards at a distance l_2 from the right support. The total length of the shaft is l. The bottom diagram, labeled 'Y', shows the shaft in a vertical plane. It has the same supports and radial forces F_{r1} and F_{r2} acting downwards at the same positions as in the X-plane. Additionally, a horizontal force F_{w1} acts to the left at the left support.</p>	<p>Student: Tawfik Abdulrahman</p> <p>Problem nr: 6</p> <p>Determine the dimensions of the shaft if it is made of steel C45 ($k_{go}=80\text{MPa}$, $k_{gj}=125\text{MPa}$, $k_{so}=45\text{MPa}$, $k_{sj}=85\text{MPa}$). The shaft transfers the torque $T= 143\text{Nm}$</p> <p>Additional assumption: variable direction of rotation of gears. The shaft dimensions defined in the drawing are as follows: $l_1=90\text{mm}$; $l_2=120\text{mm}$; $l=300\text{mm}$</p> <p>The dimensions of the gears are as follows: $D_1=200\text{mm}$, $D_2=150\text{mm}$</p> <p>The force values are as follows: $F_{t1}=1430\text{N}$; $F_{r1}=520\text{N}$; $F_{w1}=700\text{N}$ $F_{t2}=1906\text{N}$; $F_{r2}=693\text{N}$</p>
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	<p>Student: Hachem Boushaba</p> <p>Problem nr: 7</p> <p>Determine the dimensions of the shaft if it is made of steel C35 ($k_{go}=70\text{MPa}$, $k_{gj}=110\text{MPa}$, $k_{so}=40\text{MPa}$, $k_{sj}=75\text{MPa}$). The shaft transfers the torque $T= 111\text{Nm}$</p> <p>Additional assumption: constant rotation direction. The shaft dimensions defined in the drawing are as follows: $l_1=96\text{mm}$; $l_2=128\text{mm}$; $l=320\text{mm}$</p> <p>The dimensions of the gears are as follows: $D_1=250\text{mm}$, $D_2=150\text{mm}$</p> <p>The force values are as follows: $F_{t1}=888\text{N}$; $F_{r1}=323\text{N}$; $F_{w1}=340\text{N}$ $F_{t2}=1480\text{N}$; $F_{r2}=538\text{N}$</p>
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	<p>Student: Khiter Abdenmour</p> <p>Problem nr: 8</p> <p>Determine the dimensions of the shaft if it is made of steel C25 ($\sigma_{go}=65\text{MPa}$, $\sigma_{kj}=100\text{MPa}$, $\sigma_{so}=35\text{MPa}$, $\sigma_{sj}=70\text{MPa}$). The shaft transfers the torque $T= 121\text{Nm}$</p> <p>Additional assumption: constant rotation direction. The shaft dimensions defined in the drawing are as follows: $l_1=102\text{mm}$; $l_2=136\text{mm}$; $l=340\text{mm}$</p> <p>The dimensions of the gears are as follows: $D_1=300\text{mm}$, $D_2=200\text{mm}$</p> <p>The force values are as follows: $F_{t1}=806\text{N}$; $F_{r1}=293\text{N}$; $F_{w1}=270\text{N}$ $F_{t2}=1210\text{N}$; $F_{r2}=440\text{N}$</p>
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	<p>Student: Bachir Salah Eddine</p> <p>Problem nr: 9</p> <p>Determine the dimensions of the shaft if it is made of steel C55 ($k_{go}=90\text{MPa}$, $k_{gj}=140\text{MPa}$, $k_{so}=50\text{MPa}$, $k_{sj}=95\text{MPa}$). The shaft transfers the torque $T= 152\text{Nm}$</p> <p>Additional assumption: variable direction of rotation of gears. The shaft dimensions defined in the drawing are as follows: $l_1=108\text{mm}$; $l_2=72\text{mm}$; $l=360\text{mm}$</p> <p>The dimensions of the gears are as follows: $D_1=350\text{mm}$, $D_2=250\text{mm}$</p> <p>The force values are as follows: $F_{t1}=868\text{N}$; $F_{r1}=315\text{N}$; $F_{w1}=550\text{N}$ $F_{t2}=1216\text{N}$; $F_{r2}=442\text{N}$</p>
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Student: Salma Rhayate

Problem nr: 10

Determine the dimensions of the shaft if it is made of steel C35 ($k_{go}=70\text{MPa}$,

$k_{gj}=110\text{MPa}$, $k_{so}=40\text{MPa}$, $k_{sj}=75\text{MPa}$).

The shaft transfers the torque $T=305\text{Nm}$

Additional assumption: constant rotation direction. The shaft dimensions defined in

the drawing are as follows: $l_1=114\text{mm}$;

$l_2=76\text{mm}$; $l=380\text{mm}$

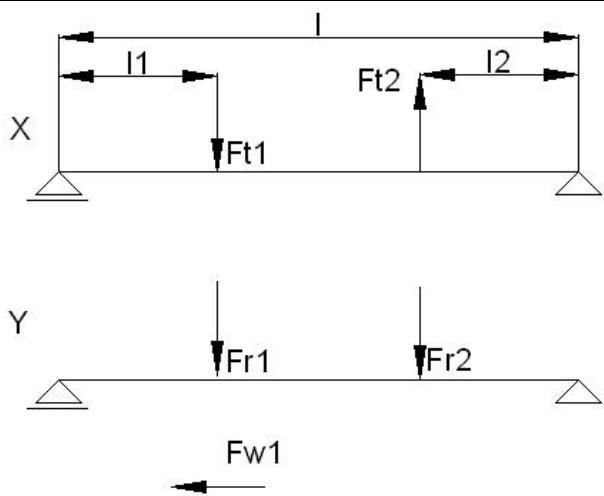
The dimensions of the gears are as follows:

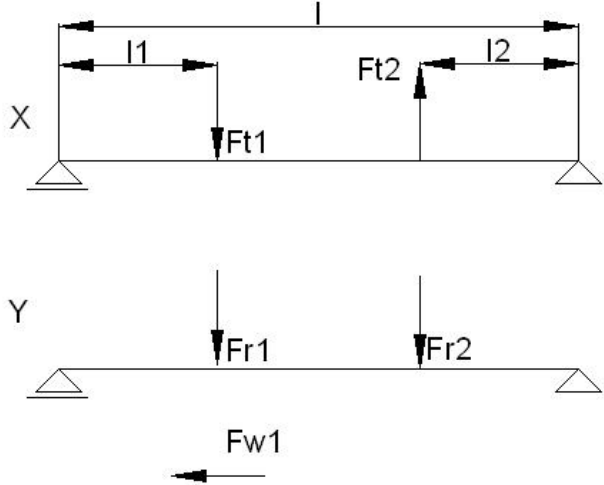
$D_1=400\text{mm}$, $D_2=250\text{mm}$

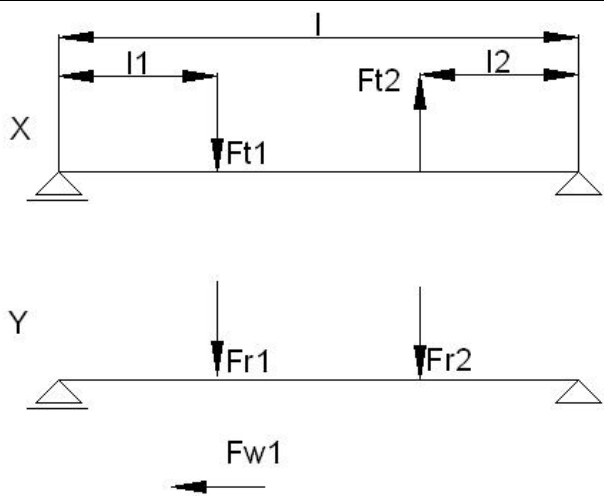
The force values are as follows:

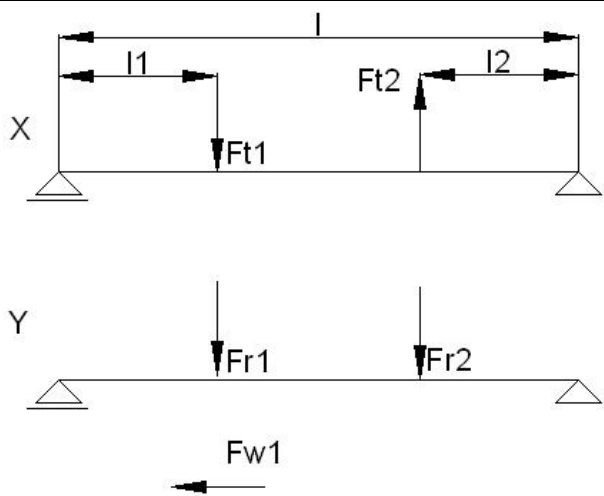
$F_{t1}=1525\text{N}$; $F_{r1}=555\text{N}$; $F_{w1}=700\text{N}$

$F_{t2}=2440\text{N}$; $F_{r2}=888\text{N}$

 <p>The image contains two free-body diagrams of a shaft. The top diagram, labeled 'X', represents the shaft in the horizontal plane. It shows a horizontal line representing the shaft with two supports at the ends. A tangential force F_{t1} acts downwards at a distance l_1 from the left support. A tangential force F_{t2} acts upwards at a distance l_2 from the right support. The total length of the shaft is labeled l. The bottom diagram, labeled 'Y', represents the shaft in the vertical plane. It shows a horizontal line with two supports. A radial force F_{r1} acts downwards at a distance l_1 from the left support. A radial force F_{r2} acts downwards at a distance l_2 from the right support. A horizontal force F_{w1} acts to the left at the left support.</p>	<p>Student: Zarat Anis</p> <p>Problem nr: 11</p> <p>Determine the dimensions of the shaft if it is made of steel C45 ($k_{go}=80\text{MPa}$, $k_{gj}=125\text{MPa}$, $k_{so}=45\text{MPa}$, $k_{sj}=85\text{MPa}$). The shaft transfers the torque $T= 286\text{Nm}$</p> <p>Additional assumption: variable direction of rotation of gears. The shaft dimensions defined in the drawing are as follows: $l_1=120\text{mm}$; $l_2=80\text{mm}$; $l=400\text{mm}$</p> <p>The dimensions of the gears are as follows: $D_1=200\text{mm}$, $D_2=150\text{mm}$</p> <p>The force values are as follows: $F_{t1}=2860\text{N}$; $F_{r1}=1040\text{N}$; $F_{w1}=240\text{N}$ $F_{t2}=3813\text{N}$; $F_{r2}=1387\text{N}$</p>
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 <p>The image contains two free body diagrams of a shaft. The top diagram, labeled 'X', shows the shaft in the horizontal plane. It has a total length l. A tangential force F_{t1} acts downwards at a distance l_1 from the left support. A tangential force F_{t2} acts upwards at a distance l_2 from the right support. The bottom diagram, labeled 'Y', shows the shaft in the vertical plane. It has the same total length l. Radial forces F_{r1} and F_{r2} act downwards at the same positions as in the X-plane. A horizontal force F_{w1} acts to the left at the left support.</p>	<p>Student: Belaid Yanis</p> <p>Problem nr: 12</p> <p>Determine the dimensions of the shaft if it is made of steel C35 ($k_{go}=70\text{MPa}$, $k_{gj}=110\text{MPa}$, $k_{so}=40\text{MPa}$, $k_{sj}=75\text{MPa}$). The shaft transfers the torque $T= 214\text{Nm}$</p> <p>Additional assumption: variable direction of rotation of gears. The shaft dimensions defined in the drawing are as follows: $l_1=126\text{mm}$; $l_2=84\text{mm}$; $l=420\text{mm}$</p> <p>The dimensions of the gears are as follows: $D_1=250\text{mm}$, $D_2=150\text{mm}$</p> <p>The force values are as follows: $F_{t1}=1712\text{N}$; $F_{r1}=623\text{N}$; $F_{w1}=400\text{N}$ $F_{t2}=2853\text{N}$; $F_{r2}=1038\text{N}$</p>
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 <p>The image contains two free body diagrams of a shaft. The top diagram, labeled 'X', shows the shaft in the horizontal plane. It has a total length l. A distance l_1 is marked from the left support to the first gear, and a distance l_2 is marked from the second gear to the right support. Tangential forces F_{t1} and F_{t2} are shown acting on the shaft at the gear locations. The bottom diagram, labeled 'Y', shows the shaft in the vertical plane. It has the same geometry. Radial forces F_{r1} and F_{r2} are shown acting downwards at the gear locations. A horizontal force F_{w1} is shown acting to the left at the left support.</p>	<p>Student: Labrach Alaa Lamisse M H</p> <p>Problem nr: 13</p> <p>Determine the dimensions of the shaft if it is made of steel C45 ($k_{go}=80\text{MPa}$, $k_{gj}=125\text{MPa}$, $k_{so}=45\text{MPa}$, $k_{sj}=85\text{MPa}$). The shaft transfers the torque $T= 191\text{Nm}$</p> <p>Additional assumption: variable direction of rotation of gears. The shaft dimensions defined in the drawing are as follows: $l_1=132\text{mm}$; $l_2=88\text{mm}$; $l=440\text{mm}$</p> <p>The dimensions of the gears are as follows: $D_1=300\text{mm}$, $D_2=200\text{mm}$</p> <p>The force values are as follows: $F_{t1}=1273\text{N}$; $F_{r1}=463\text{N}$; $F_{w1}=300\text{N}$ $F_{t2}=1910\text{N}$; $F_{r2}=695\text{N}$</p>
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	<p>Student: Kadid Abdelrrahim</p> <p>Problem nr: 14</p> <p>Determine the dimensions of the shaft if it is made of steel C25 ($\sigma_{go}=65\text{MPa}$, $\sigma_{kj}=100\text{MPa}$, $\sigma_{so}=35\text{MPa}$, $\sigma_{sj}=70\text{MPa}$). The shaft transfers the torque $T= 159\text{Nm}$</p> <p>Additional assumption: constant rotation direction. The shaft dimensions defined in the drawing are as follows: $l_1=138\text{mm}$; $l_2=92\text{mm}$; $l=460\text{mm}$</p> <p>The dimensions of the gears are as follows: $D_1=350\text{mm}$, $D_2=250\text{mm}$</p> <p>The force values are as follows: $F_{t1}=908\text{N}$; $F_{r1}=330\text{N}$; $F_{w1}=400\text{N}$ $F_{t2}=1272\text{N}$; $F_{r2}=462\text{N}$</p>
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