Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Physics 11

**Force Table Lab**

**First Case: 3 masses that are all the same**

Set up the force table with three masses that are all the same. Adjust the pulley positions so that the forces are as close to balanced as you can get them (i.e. the net force on the ring is zero). You will make your life a lot easier if you keep one pulley at zero degrees (i.e. North).

To the right of the compass below, draw a free body diagram for the ring, showing the three forces acting on it (ignore the force that gravity exerts on the ring). On your FBD, label each force with its magnitude (in Newtons) and its direction. For direction, *always* use the form \_\_o \_\_\_ of \_\_\_!

**W**

**S**

**E**

**N**

0o

180o

Now, find the x-and y- components for each force. Find the net force in the x-direction, find the net force in the y-direction, and combine them to get the total net force. Write its magnitude and direction.

Turn page over

Now let’s find the net force a different way. In the space below add the forces from your FBD together graphically by drawing them. Use a ruler so that your magnitudes are accurate and a protractor so that your directions are accurate. Choose a scale that uses as much of the page as possible. When you’re finished, draw the resultant and measure and record its magnitude and direction.

Scale: 1 N = \_\_\_\_\_\_\_\_\_\_ cm

**W**

**S**

**E**

**N**

0o

180o

If you’ve been careful with your drawing, your resultant should be the same as the net force you calculate on the other side of this page. If you did the experiment REALLY well, they should both be zero.

**Second Case: 3 masses that are all different**

Set up the force table with three masses that are all different. Adjust the pulley positions so that the forces are as close to balanced as you can get them (i.e. the net force on the ring is zero). You will make your life a lot easier if you keep one pulley at zero degrees (i.e. North).

To the right of the compass below, draw a free body diagram for the ring, showing the three forces acting on it (ignore the force that gravity exerts on the ring). On your FBD, label each force with its magnitude (in Newtons) and its direction. For direction, *always* use the form \_\_o \_\_\_ of \_\_\_!

**W**

**S**

**E**

**N**

0o

180o

Now, find the x-and y- components for each force. Find the net force in the x-direction, find the net force in the y-direction, and combine them to get the total net force. Write its magnitude and direction.

Turn page over

Now let’s find the net force a different way. In the space below add the forces from your FBD together graphically by drawing them. Use a ruler so that your magnitudes are accurate and a protractor so that your directions are accurate. Choose a scale that uses as much of the page as possible. When you’re finished, draw the resultant and measure and record its magnitude and direction.

Scale: 1 N = \_\_\_\_\_\_\_\_\_\_ cm

**W**

**S**

**E**

**N**

0o

180o



If you’ve been careful with your drawing, your resultant should be the same as the net force you calculate on the other side of this page. If you did the experiment REALLY well, they should both be zero.

**Third Case: 4 masses that are all different**

Set up the force table with four masses that are all different. Adjust the pulley positions so that the forces are as close to balanced as you can get them (i.e. the net force on the ring is zero). You will make your life a lot easier if you keep one pulley at zero degrees (i.e. North).

To the right of the compass below, draw a free body diagram for the ring, showing the four forces acting on it (ignore the force that gravity exerts on the ring). On your FBD, label each force with its magnitude (in Newtons) and its direction. For direction, *always* use the form \_\_o \_\_\_ of \_\_\_!

**W**

**S**

**E**

**N**

0o

180o

Now, find the x-and y- components for each force. Find the net force in the x-direction, find the net force in the y-direction, and combine them to get the total net force. Write its magnitude and direction.

Turn page over

Now let’s find the net force a different way. In the space below add the forces from your FBD together graphically by drawing them. Use a ruler so that your magnitudes are accurate and a protractor so that your directions are accurate. Choose a scale that uses as much of the page as possible. When you’re finished, draw the resultant and measure and record its magnitude and direction.

Scale: 1 N = \_\_\_\_\_\_\_\_\_\_ cm

**W**

**S**

**E**

**N**

0o

180o



If you’ve been careful with your drawing, your resultant should be the same as the net force you calculate on the other side of this page. If you did the experiment REALLY well, they should both be zero.