Patterning - Spring **Exam 1 Collaborative Reflection Version**
Multiple Choice

Work collaboratively in your small group and come to consensus on the answers to the following. Upon completion, work collaboratively with a neighboring group until you come to consensus. Submit this page when directed.

Group Member's Names:

_____ _____

_____ _____

1. A person stands in an elevator that is moving up.
a) What can you say about the direction of the person's acceleration?

acceleration points up	acceleration points down	acceleration is zero	direction of acceleration can't be determined without more information

b) What can you say about the direction of the net force acting on the person?

net force points up	net force points down	net force is zero	direction of net force can't be determined without more information

c) What can you say about the magnitude of the normal force of the floor on the person, N, compared to the magnitude of the force of gravity acting on the person, w?

$N \geq w$	$N > w$	$N = w$	$N < w$	$N \leq w$	Not enough information to compare

2. A 50 kg person stands in an elevator that is moving up but slowing down at 1 m/s^2.
a) What can you say about the direction of the person's acceleration?

acceleration points up	acceleration points down	acceleration is zero	direction of acceleration can't be determined without more information

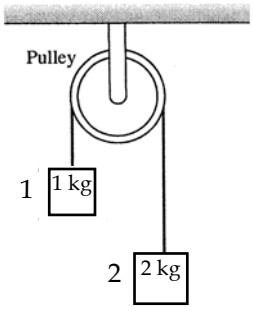
b) What can you say about the direction of the net force acting on the person?

net force points up	net force points down	net force is zero	direction of net force can't be determined without more information

c) What can you say about the magnitude of the normal force of the floor on the person, N, compared to the magnitude of the force of gravity acting on the person, w?

$N \geq w$	$N > w$	$N = w$	$N < w$	$N \leq w$	Not enough information to compare

3. Blocks 1 and 2 are connected by a massless string over a massless, frictionless pulley, as shown in the figure. The blocks are released from rest.



a) What can you say about the direction of block 2's acceleration?

acceleration points up	acceleration points down	acceleration is zero	direction of acceleration can't be determined without more information

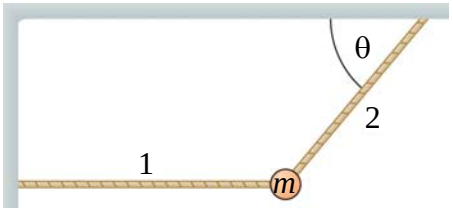
b) What can you say about the direction of net force acting on block 2?

net force points up	net force points down	net force is zero	direction of net force can't be determined without more information

c) What can you say about the magnitude of the tension force in the rope, T, compared to the magnitude of the force of gravity on block 2, w_2?

$T > w_2$	$T = w_2$	$T < w_2$	Not enough information to compare

4. A ball of mass m is suspended by two light strings 1 and 2 as shown in the figure. The angle θ is unknown, and the figure is not drawn to scale.



a) What can you say about the magnitude of the tension force in string 1, T_1, compared to the magnitude of the tension force in string 2, T_2?

$T_1 > T_2$ $\quad$ $T_1 = T_2$ $\quad$ $T_1 < T_2$ $\quad$ Can't compare without knowing m $\quad$ Can't compare without knowing θ

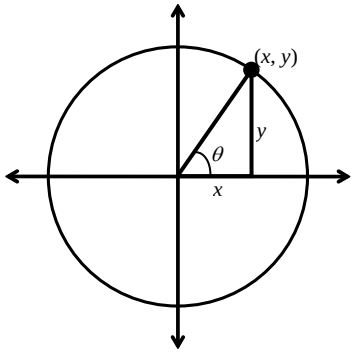
b) What can you say about the magnitude of the tension force in string 2, T_2, compared to the magnitude of the force of gravity on the ball, w?

$T_2 > w$ $\quad$ $T_2 = w$ $\quad$ $T_2 < w$ $\quad$ Can't compare without knowing m $\quad$ Can't compare without knowing θ

c) What can you say about T_1 compared to w?

$T_1 > w$ $\quad$ $T_1 = w$ $\quad$ $T_1 < w$ $\quad$ Can't compare without knowing m $\quad$ Can't compare without knowing θ

5. Given the unit circle to the right. Which of the following are equal to $\sin\theta$? There is more than one correct answer. Circle ALL correct answers.



x $\quad$ $\frac{1}{x}$ $\quad$ $\sqrt{1-x^2}$ $\quad$ y $\quad$ $\frac{1}{y}$ $\quad$ $\sqrt{1-y^2}$

$1-\cos\theta$ $\quad$ $\sqrt{1-\cos^2\theta}$ $\quad$ $\sin(-\theta)$ $\quad$ $\sin(\pi-\theta)$

6. The Cartesian coordinate $(x, y) = (-3, 4)$ is converted to the polar coordinate (r, θ). What is θ, in degrees? Circle one.

36.9° $\quad$ **53.1°** $\quad$ **126.9°** $\quad$ **143.1°** $\quad$ **–36.9°** $\quad$ **–53.1°** $\quad$ **–126.9°** $\quad$ **–143.1°** $\quad$ **none of these**

7. A velocipede travels at a constant angular speed around a circular track at a radius of 2.0 km. The velocipede completes 4 revolutions in 5 hours.

a) How long did the velocipede take to complete 3 revolutions? (circle one; all are in hours)

4/15 $\quad$ **5/12** $\quad$ **4/5** $\quad$ **5/4** $\quad$ **12/5** $\quad$ **15/4** $\quad$ **none of these**

b) What is the velocipede's linear (tangential) speed? (circle one; all are in km/hr)

2/5π $\quad$ **2/5** $\quad$ **5/2π** $\quad$ **2π/5** $\quad$ **5/2** $\quad$ **5π/2** $\quad$ **none of these**

8. Write the letter of the function which best models the following physical situations:

A – linear $\quad$ **B – quadratic** $\quad$ **C – sinusoidal** $\quad$ **D – exponential** $\quad$ **E – none of these**

a) The position vs. time for a battery powered tumble buggy moving in a straight line. _____

b) The position vs. time for a mass on a spring moving up and down. _____

c) The position vs. time for a ball falling straight down only influenced by gravity. _____

d) The x-component of position vs. time for a block sitting on a turntable that is rotating at a constant rate. _____

e) Fundamental frequency vs. key number for notes played on a piano. _____

f) Sound pressure vs. time for a pure tone from a tuning fork. _____