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Activity 1: Getting the Angle on Acceleration

Question Group 1

Questions 1

A bicyle wheel is slowing spinning, undergoing an angular position change of 1.0 radians each second. Is the bicycle wheel experiencing an angular acceleration?

Questions 2

A bicyle wheel is slowing spinning, undergoing an angular position change of 1.5 radians each second. Is the bicycle wheel experiencing an angular acceleration?

Questions 3

A bicyle wheel is slowing spinning, undergoing an angular position change of 2.0 radians each second. Is the bicycle wheel experiencing an angular acceleration?

Question Group 2

Questions 4

A bicycle wheel is observed to be changing its angular velocity by 0.25 rad/s every second for time of 10 seconds. Is the bicycle wheel undergoing an angular acceleration?

Questions 5

A bicycle wheel is observed to be changing its angular velocity by 0.40 rad/s every second for time of 8 seconds. Is the bicycle wheel undergoing an angular acceleration?

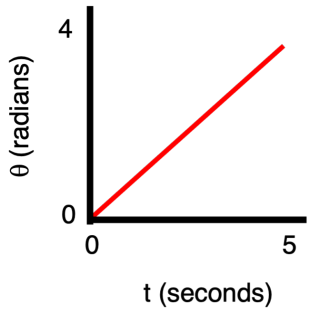
Questions 6

A bicycle wheel is observed to be changing its angular velocity by 0.50 rad/s every second for time of 6 seconds. Is the bicycle wheel undergoing an angular acceleration?

Question Group 3

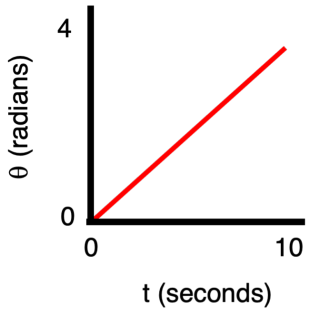
Questions 7

The plot shows the changes in angular position (θ) of a fan blade over the course of 5 seconds. Is the fan blade experiencing an angular acceleration?



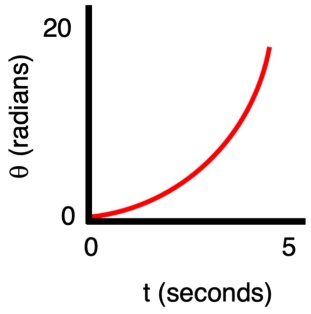
Questions 8

The plot shows the changes in angular position (θ) of a fan blade over the course of 10 seconds. Is the fan blade experiencing an angular acceleration?



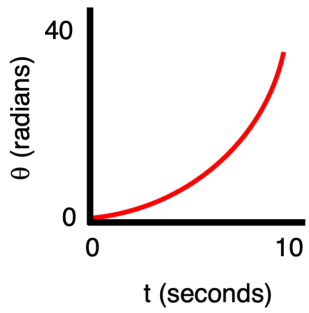
Questions 9

The plot shows the changes in angular position (θ) of a fan blade over the course of 5 seconds. Is the fan blade experiencing an angular acceleration?



Questions 10

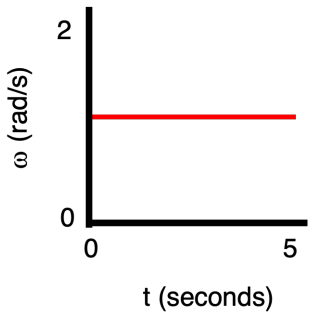
The plot shows the changes in angular position (θ) of a fan blade over the course of 10 seconds. Is the fan blade experiencing an angular acceleration?



Question Group 4

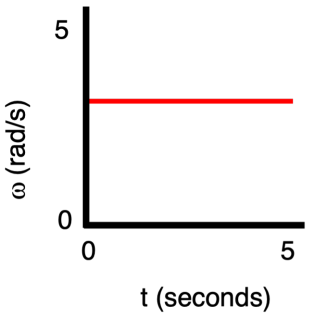
Questions 11

The angular velocity (ω) as a function of time for the rotating fan blades of an air conditioning unit are shown at the right. Are the fan blades experiencing an angular acceleration?



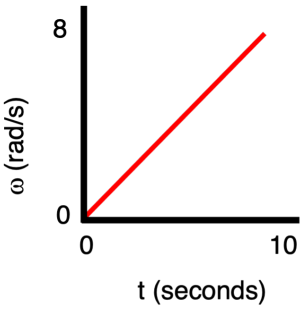
Questions 12

The angular velocity (ω) as a function of time for the rotating fan blades of an air conditioning unit are shown at the right. Are the fan blades experiencing an angular acceleration?



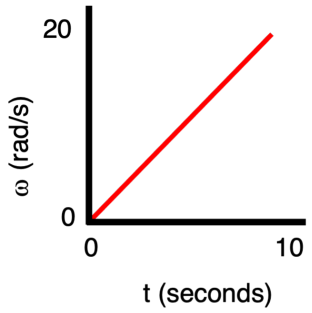
Questions 13

The angular velocity (ω) as a function of time for the rotating fan blades of an air conditioning unit are shown at the right. Are the fan blades experiencing an angular acceleration?



Questions 14

The angular velocity (ω) as a function of time for the rotating fan blades of an air conditioning unit are shown at the right. Are the fan blades experiencing an angular acceleration?



Question Group 5

Questions 15

The table shows how the angular position (θ) of a point on a rotating platform is changing with respect to time (t). Is the platform undergoing an angular acceleration?

t (s)	θ (rad)
0.0	0.0
1.0	1.0
2.0	2.0
3.0	3.0
4.0	4.0
5.0	5.0

Questions 16

The table shows how the angular position (θ) of a point on a rotating platform is changing with respect to time (t). Is the platform undergoing an angular acceleration?

t (s)	θ (rad)
0.0	0.0
1.0	1.5
2.0	3.0
3.0	4.5
4.0	6.0
5.0	7.5

Questions 17

The table shows how the angular position (θ) of a point on a rotating platform is changing with respect to time (t). Is the platform undergoing an angular acceleration?

t (s)	θ (rad)
0.0	0.0
1.0	0.5
2.0	2.0
3.0	4.5
4.0	8.0
5.0	12.5

Questions 18

The table shows how the angular position (θ) of a point on a rotating platform is changing with respect to time (t). Is the platform undergoing an angular acceleration?

t (s)	θ (rad)
0.0	0.0
1.0	1.0
2.0	4.0
3.0	9.0
4.0	16.0
5.0	25.0

Question Group 6

Questions 19

The table shows how the angular velocity (ω) of a point on a rotating platform is changing with respect to time (t). Is the platform undergoing an angular acceleration?

t (s)	ω (rad/s)
0.0	4.0
1.0	4.0
2.0	4.0
3.0	4.0
4.0	4.0
5.0	4.0

Questions 20

The table shows how the angular velocity (ω) of a point on a rotating platform is changing with respect to time (t). Is the platform undergoing an angular acceleration?

t (s)	ω (rad/s)
0.0	6.0
1.0	6.0
2.0	6.0
3.0	6.0
4.0	6.0
5.0	6.0

Questions 21

The table shows how the angular velocity (ω) of a point on a rotating platform is changing with respect to time (t). Is the platform undergoing an angular acceleration?

t (s)	ω (rad/s)
0.0	0.0
1.0	1.2
2.0	2.4
3.0	3.6
4.0	4.8
5.0	6.0

Questions 22

The table shows how the angular velocity (ω) of a point on a rotating platform is changing with respect to time (t). Is the platform undergoing an angular acceleration?

t (s)	ω (rad/s)
0.0	0.0
1.0	1.5
2.0	3.0
3.0	4.5
4.0	6.0
5.0	7.5

Activity 2: +, -, or 0
Question Group 7
Questions 23
A bicycle wheel is rotating counterclockwise. It is gradually slowing down.
The angular velocity is _____,
a. positive b. negative c. zero

and the angular acceleration is _____.
a. positive b. negative c. zero

Questions 24
A bicycle wheel is rotating clockwise. It is gradually slowing down.
The angular velocity is _____,
a. positive b. negative c. zero

and the angular acceleration is _____.
a. positive b. negative c. zero

Question Group 8
Questions 25
A bicycle wheel is rotating counterclockwise. It is gradually speeding up.
The angular velocity is _____,
a. positive b. negative c. zero

and the angular acceleration is _____.
a. positive b. negative c. zero

Questions 26
A bicycle wheel is rotating clockwise. It is gradually speeding up.
The angular velocity is _____,
a. positive b. negative c. zero

and the angular acceleration is _____.
a. positive b. negative c. zero

Question Group 9
Questions 27
A bicycle wheel is rotating counterclockwise. It's angular speed is constant.
The angular velocity is _____,

a. positive b. negative c. zero

and the angular acceleration is _____.
a. positive b. negative c. zero

Questions 28
A bicycle wheel is rotating clockwise. It's angular speed is constant.
The angular velocity is _____,
a. positive b. negative c. zero

and the angular acceleration is _____.
a. positive b. negative c. zero

Activity 3: Crunching the Numbers
Question Group 10
Questions 29
A spinning platform is rotating clockwise at 10 rad/s. It slows to a stop in 5.0 seconds. What is its angular acceleration in rad/s^2?

Questions 30
A spinning platform is rotating clockwise at 12 rad/s. It slows to a stop in 4.0 seconds. What is its angular acceleration in rad/s^2?

Questions 31
A spinning platform is rotating clockwise at 10 rad/s. It slows to a stop in 4 seconds. What is its angular acceleration in rad/s^2?

Question Group 11
Questions 32
A pulley is rotating counterclockwise at 1.2 rad/s. It increases its angular velocity to 4.8 rad/s in 3.0 s. What is its angular acceleration in rad/s^2?

Questions 33

A pulley is rotating counterclockwise at 1.5 rad/s. It increases its angular velocity to 6.0 rad/s in 4.0 s. What is its angular acceleration in rad/s^2?

Questions 34

A pulley is rotating counterclockwise at 1.6 rad/s. It increases its angular velocity to 6.4 rad/s in 8.0 s. What is its angular acceleration in rad/s^2?

Question Group 12

Questions 35

The angular velocity as a function of time for a rotating object is shown at the right. What is its angular acceleration in rad/s^2?

t (s)	ω (rad/s)
0.0	1.5
1.0	3.0
2.0	4.5
3.0	6.0
4.0	7.5
5.0	9.0

Questions 36

The angular velocity as a function of time for a rotating object is shown at the right. What is its angular acceleration in rad/s^2?

t (s)	ω (rad/s)
0.0	2.4
1.0	3.6
2.0	4.8
3.0	6.0
4.0	7.2
5.0	8.4

Questions 37

The angular velocity as a function of time for a rotating object is shown at the right. What is its angular acceleration in rad/s^2?

t (s)	ω (rad/s)
0.0	1.0
1.0	2.8
2.0	4.6
3.0	6.4
4.0	8.2
5.0	10.0

Question Group 12

Questions 38

The angular velocity as a function of time for a rotating object is shown at the right. What is its angular acceleration in rad/s^2?

t (s)	ω (rad/s)
0.0	1.5
0.5	3.0
1.0	4.5
1.5	6.0
2.0	7.5

Questions 39

The angular velocity as a function of time for a rotating object is shown at the right. What is its angular acceleration in rad/s^2?

t (s)	ω (rad/s)
0.0	2.4
0.5	3.6
1.0	4.8
1.5	6.0
2.0	7.2

Questions 40

The angular velocity as a function of time for a rotating object is shown at the right. What is its angular acceleration in rad/s^2?

t (s)	ω (rad/s)
0.0	1.0
0.5	2.8
1.0	4.6
1.5	6.4
2.0	8.2