



We always knew you were a keeper.
You are now resubscribed to Chegg Study.

Question: A horizontal force F is exerted on a 20- kg box to slide it up a 30...

A horizontal force F is exerted on a 20- kg box to slide it up a 30° incline. The friction force retarding the motion is 80 N. How large must F be if the acceleration of the moving box is to be a) zero and b) 0.75 m/s²?
Answer is a) .21 kN
b) .22 kN
what is the work to get this answer?

Expert Answer



kingAnswer answered this
36,539 answers

Was this answer helpful?



here,

let the horizontal force be F

mass of the block , m = 20 kg

theta = 30 degree

frictional force , ff = 80 N

(a)

when the acceleration is zero

$$F \cdot \cos(30) - ff - m \cdot g \cdot \sin(\theta) = m \cdot a$$

$$F \cdot \cos(30) - 80 - 20 \cdot 9.8 \cdot \sin(30) = 0$$

$$F = 205.53 \text{ N}$$

the required force F for constant acceleration is 0.21 kN

(b)

for acceleration of block , a' = 0.75 m/s²

$$F \cdot \cos(30) - ff - m \cdot g \cdot \sin(\theta) = m \cdot a$$

$$F \cdot \cos(30) - 80 - 20 \cdot 9.8 \cdot \sin(30) = 20 \cdot 0.75$$

$$F = 222.86 \text{ N}$$

the required force F for constant acceleration is 0.22 kN

here,

let the horizontal force be F

mass of the block , m = 20 kg

theta = 30 degree

frictional force , ff = 80 N

(a)

when the acceleration is zero

$$F \cdot \cos(30) - ff - m \cdot g \cdot \sin(\theta) = m \cdot a$$

$$F \cdot \cos(30) - 80 - 20 \cdot 9.8 \cdot \sin(30) = 0$$

$$F = 205.53 \text{ N}$$

the required force F for constant acceleration is 0.21 kN

(b)

for acceleration of block , a' = 0.75 m/s²

$$F \cdot \cos(30) - ff - m \cdot g \cdot \sin(\theta) = m \cdot a$$

$$F \cdot \cos(30) - 80 - 20 \cdot 9.8 \cdot \sin(30) = 20 \cdot 0.75$$

$$F = 222.86 \text{ N}$$

the required force F for constant acceleration is 0.22 kN

Comment >

Post a question

Answers from our experts for your tough homework questions

Enter question

Continue to post

20 questions remaining

My Textbook Solutions

Elementary Differential... 8th Edition	Statistics for Business... 11th Edition	Cost Accounting 15th Edition
View all solutions		

Up next for you in Physics

<p>Pipe A is 0.50 m long and open at both ends. Pipe B is open at one end and closed at the other end. Determin...</p> <p>9. Pipe A is 0.50 m long and open at both ends, other end. Determine the length of pipe B is at A.</p> <p>See answer</p>	<p>A horizontal force of 200 N is required to cause a 15 kg block to slide up a 20° incline with an acceleration of 0.25 m/s². Find: a) the friction force on the block. (134 NJ b) the coefficient of friction. (0.65)</p> <p>See answer</p>	<p>See more questions for subjects you study</p>
--	---	--

Questions viewed by other students

Q: A horizontal force F is exerted on a 20-kg box to slide it up a 30degrees incline. The friction force retarding the motion is 80 N. How large must F be if the acceleration of the moving box is to (a) zero and (b) 0.75m/s²

A: See answer

Q: A horizontal force of 200N is required to cause a 1.5 kg block to slide up a 20 degree incline with an acceleration of 25cm/s². Fine (a) the friction force on the block and (b) the coefficient of friction.

A: See answer

Show more >

COMPANY

About Chegg
Chegg For Good
College Marketing
Corporate Development
Investor Relations
Jobs
Join Our Affiliate Program
Media Center
Site Map

LEGAL & POLICIES

Advertising Choices
Cookie Notice
General Policies
Intellectual Property Rights
Terms of Use
Global Privacy Policy
DO NOT SELL MY INFO
Honor Code
Honor Shield

CHEGG PRODUCTS AND SERVICES

Chegg Textbooks
Chegg Coupon
Chegg Play
Chegg Study Help
College Textbooks
eTextbooks
Flashcards
Learn
Chegg Math Solver

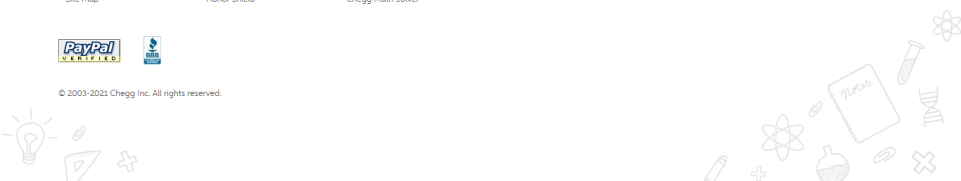
Mobile Apps
Sell Textbooks
Solutions Manual
Study 101
Textbook Rental
Used Textbooks
Digital Access Codes
Chegg Money

CHEGG NETWORK

EasyBib
Internships.com
Thinkful

CUSTOMER SERVICE

Customer Service
Give Us Feedback
Help with eTextbooks
Manage Chegg Study Subscription
Return Your Books
Textbook Return Policy



Find solutions for your homework

Search

home / study / science / physics / physics questions and answers / calculate the average horsepower required to raise a 150kg drum to a height of 20...

Question: Calculate the average horsepower required to raise a 150kg dru...

(1 bookmark)

Calculate the average horsepower required to raise a 150kg drum to a height of 20m in a time of 1.0 minute.

Best Answer

Anonymous answered this
 663 answers
 Answer:
 0.66 horsepower
 =====
 Explanation:
 Work = Force x Distance
 Force = Mass x Acceleration
 Hence, Work = (Mass x Acceleration) x Distance

Was this answer helpful?

~Mass = 150 kg
 ~Acceleration = 9.81 m/s² (due to gravity)
 ~Distance = 20 m

Plugging all that in, work is 29,430 J
 Power = Joules/second
 1 minute = 60 seconds
 Hence, Power = 29,430 J / 60. sec = 490.5 Watts

1 Horsepower = 745.7 Watts
 Hence, (490.5 W) x (1 / 745.7) = 0.66 horsepower

Hope this helped...

Comment >

Post a question

Answers from our experts for your toughest homework questions

Enter question

Continue to post

20 questions remaining



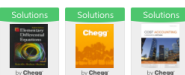
Snap a photo from your phone to post a question. We'll send you a one-time download link.

888-888-8888

Text me

By providing your phone number, you agree to receive a one-time automated text message with a link to get the app. Standard messaging rates may apply.

My Textbook Solutions



[Elementary Differential...](#)
 8th Edition
[Statistics for Business...](#)
 11th Edition
[Cost Accounting](#)
 15th Edition
 View all solutions

More Answers

krishnam answered this
 6,535 answers
 power = mgh / time = 150*9.8*20/60 = 0.656 hp

Was this answer helpful?

Comment >

krishnam answered this
 6,535 answers
 average horse power = mgh / t = 490 watts (1 hp = 746 watts)
 so power = 0.656 hp

Was this answer helpful?

Comment >

Up next for you in Physics

10. Two timpani (tunable drums) are played at the same time. One is correctly tuned so that when it is str...

[See answer](#)

A horizontal force of 200 N is required to cause a 15 kg block to slide up a 20° incline with an acceleration of 0.25 m/s². Find: a) the friction force on the block. (134 N) b) the coefficient of friction. (0.65)

[See answer](#)

See more questions for subjects you study

Questions viewed by other students

Q: What's the average required power to raise a 150-kg drum to a height of 20 m in a time of 1.0 min? (Answer in kW)

A: [See answer](#)

Q: a 900kg car whose motor can deliver 40.0Hp to the wheels and maintain a steady 130km/hm on a horizontal roadway...how large is the friction force that impedes its motion at this speed? please show all work...thanks

A: [See answer](#)

Show more >

COMPANY

[About Chegg](#)
[Chegg For Good](#)
[College Marketing](#)
[Corporate Development](#)
[Investor Relations](#)
[Jobs](#)
[Join Our Affiliate Program](#)
[Media Center](#)
[Site Map](#)

LEGAL & POLICIES

[Advertising Choices](#)
[Cookie Notice](#)
[General Policies](#)
[Intellectual Property Rights](#)
[Terms of Use](#)
[Global Privacy Policy](#)
[DO NOT SELL MY INFO](#)
[Honor Code](#)
[Honor Shield](#)

CHEGG PRODUCTS AND SERVICES

[Cheap Textbooks](#)
[Chegg Coupon](#)
[Chegg Play](#)
[Chegg Study Help](#)
[College Textbooks](#)
[eTextbooks](#)
[Flashcards](#)
[Learn](#)
[Chegg Math Solver](#)

Mobile Apps

[Sell Textbooks](#)
[Solutions Manual](#)
[Study 101](#)
[Textbook Rental](#)
[Used Textbooks](#)
[Digital Access Codes](#)
[Chegg Money](#)

CHEGG NETWORK

[EasyBib](#)
[Internships.com](#)
[Thinkful](#)

CUSTOMER SERVICE

[Customer Service](#)
[Give Us Feedback](#)
[Help with eTextbooks](#)
[Help to use EasyBib Plus](#)
[Manage Chegg Study Subscription](#)
[Return Your Books](#)
[Textbook Return Policy](#)

