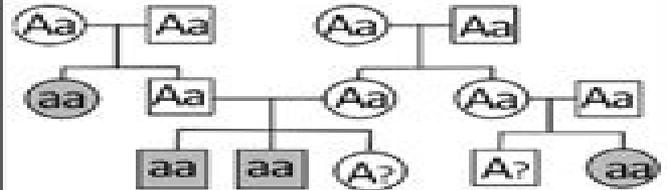


Pedigrees Practice - AP Biology

- for each pedigree, write the genotypes of the individuals

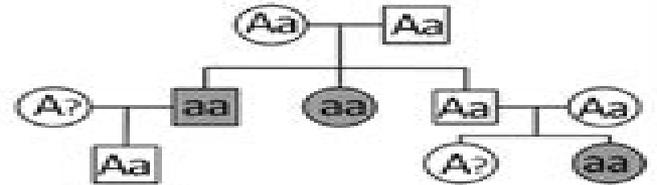
The disorder shown on the pedigree is **Maple Syrup Urine Disease (MSUD)** which is a metabolic disorder that affects the body's ability to process certain proteins. It was named after a distinctive odor of a baby's urine.

- What is the inheritance pattern of this gene?
 - autosomal dominant
 - autosomal recessive**
 - X-linked dominant
 - X-linked recessive
- Provide at least one piece of evidence for your claim. **Two parents that do not have the disease must be carriers (Aa) to have a child with the disease.**



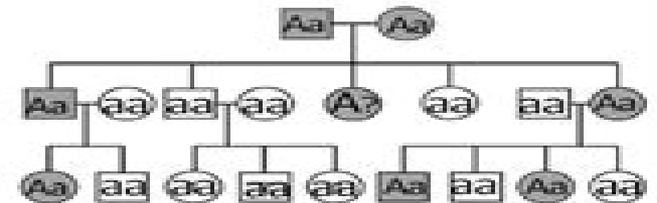
This pedigree shows the inheritance **Leber congenital amaurosis (LCA)** which is a type of hereditary blindness. Individuals with this disease lose their vision during childhood.

- What is the inheritance pattern shown? **autosomal recessive**
- Highlight one individual whose genotype is unknown. What additional information would you need to determine his/her genotype? **if the unknowns had children, it could reveal if they were carriers.**



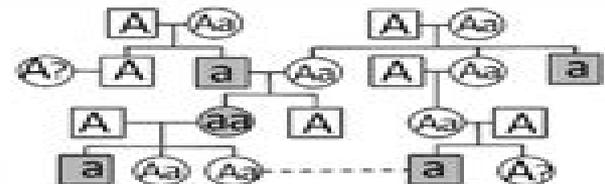
Marfan syndrome affects the connective tissue and causes individuals to have long, thin, arms, legs, fingers and toes.

- What is the inheritance pattern shown? **autosomal dominant**
- Provide at least one piece of evidence for your claim. **The first two parents both had Marfan syndrome, but had children who did not have the disorder.**
- Consider the children labeled "1,2,3." Would you expect any of these individuals to have children of their own with Marfan Syndrome. **Anyone without the syndrome must be recessive, because the disorder is dominant, this branch of the family tree will all be "normal."** This is a good time to discuss where the first individual got the disease, likely it was a spontaneous mutation in the gene.



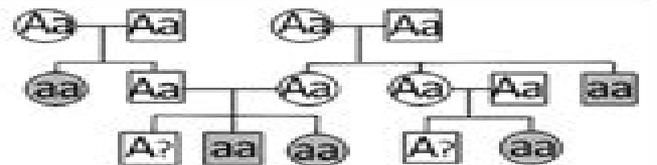
Charcot-Marie-Tooth disease (CMT) causes motor and sensory neuropathies of the peripheral nervous system characterized by progressive loss of muscle tissue and touch sensation across various parts of the body.

- What is the inheritance pattern shown? **X-linked recessive**
- Provide at least one piece of evidence for your claim. **The disease mainly affects boys, though a girl can have it if her father had it and her mother was a carrier.**
- The dashed line represents a possible union. Discuss the probability that such a union would result in a child with CMT. **Since the child will inherit the mutant allele from the father, a female has a 50% chance of having the disorder. A male child also has a 50% chance of inheriting the allele from his heterozygote mother.**



Cystic fibrosis is a disease that affects the ability of cells to move sodium across the cell membrane. This causes mucus to build up in the lungs resulting in respiratory problems.

- What is the inheritance pattern shown? **autosomal recessive**
- Provide at least one piece of evidence for your claim. **Two parents that do not have the disease must be carriers (Aa) to have a child with the disease.**



Human Pedigree Genetics Bio Lab Answers

Mike Jess



Human Pedigree Genetics Bio Lab Answers:

Right here, we have countless ebook **Human Pedigree Genetics Bio Lab Answers** and collections to check out. We additionally manage to pay for variant types and plus type of the books to browse. The enjoyable book, fiction, history, novel, scientific research, as capably as various additional sorts of books are readily friendly here.

As this Human Pedigree Genetics Bio Lab Answers, it ends occurring innate one of the favored book Human Pedigree Genetics Bio Lab Answers collections that we have. This is why you remain in the best website to see the amazing ebook to have.

https://matrix.jamesarcher.co/data/publication/Download_PDFS/compression_properties_astm_d695_iso_604_intertek.pdf

Table of Contents Human Pedigree Genetics Bio Lab Answers

1. Understanding the eBook Human Pedigree Genetics Bio Lab Answers
 - The Rise of Digital Reading Human Pedigree Genetics Bio Lab Answers
 - Advantages of eBooks Over Traditional Books
2. Identifying Human Pedigree Genetics Bio Lab Answers
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Human Pedigree Genetics Bio Lab Answers
 - User-Friendly Interface
4. Exploring eBook Recommendations from Human Pedigree Genetics Bio Lab Answers
 - Personalized Recommendations
 - Human Pedigree Genetics Bio Lab Answers User Reviews and Ratings
 - Human Pedigree Genetics Bio Lab Answers and Bestseller Lists
5. Accessing Human Pedigree Genetics Bio Lab Answers Free and Paid eBooks

- Human Pedigree Genetics Bio Lab Answers Public Domain eBooks
 - Human Pedigree Genetics Bio Lab Answers eBook Subscription Services
 - Human Pedigree Genetics Bio Lab Answers Budget-Friendly Options
6. Navigating Human Pedigree Genetics Bio Lab Answers eBook Formats
- ePub, PDF, MOBI, and More
 - Human Pedigree Genetics Bio Lab Answers Compatibility with Devices
 - Human Pedigree Genetics Bio Lab Answers Enhanced eBook Features
7. Enhancing Your Reading Experience
- Adjustable Fonts and Text Sizes of Human Pedigree Genetics Bio Lab Answers
 - Highlighting and Note-Taking Human Pedigree Genetics Bio Lab Answers
 - Interactive Elements Human Pedigree Genetics Bio Lab Answers
8. Staying Engaged with Human Pedigree Genetics Bio Lab Answers
- Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Human Pedigree Genetics Bio Lab Answers
9. Balancing eBooks and Physical Books Human Pedigree Genetics Bio Lab Answers
- Benefits of a Digital Library
 - Creating a Diverse Reading Collection Human Pedigree Genetics Bio Lab Answers
10. Overcoming Reading Challenges
- Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Human Pedigree Genetics Bio Lab Answers
- Setting Reading Goals Human Pedigree Genetics Bio Lab Answers
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Human Pedigree Genetics Bio Lab Answers
- Fact-Checking eBook Content of Human Pedigree Genetics Bio Lab Answers
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
- Utilizing eBooks for Skill Development

- Exploring Educational eBooks
14. Embracing eBook Trends
- Integration of Multimedia Elements
 - Interactive and Gamified eBooks

Human Pedigree Genetics Bio Lab Answers Introduction

Human Pedigree Genetics Bio Lab Answers Offers over 60,000 free eBooks, including many classics that are in the public domain. Open Library: Provides access to over 1 million free eBooks, including classic literature and contemporary works. Human Pedigree Genetics Bio Lab Answers Offers a vast collection of books, some of which are available for free as PDF downloads, particularly older books in the public domain. Human Pedigree Genetics Bio Lab Answers : This website hosts a vast collection of scientific articles, books, and textbooks. While it operates in a legal gray area due to copyright issues, its a popular resource for finding various publications. Internet Archive for Human Pedigree Genetics Bio Lab Answers : Has an extensive collection of digital content, including books, articles, videos, and more. It has a massive library of free downloadable books. Free-eBooks Human Pedigree Genetics Bio Lab Answers Offers a diverse range of free eBooks across various genres. Human Pedigree Genetics Bio Lab Answers Focuses mainly on educational books, textbooks, and business books. It offers free PDF downloads for educational purposes. Human Pedigree Genetics Bio Lab Answers Provides a large selection of free eBooks in different genres, which are available for download in various formats, including PDF. Finding specific Human Pedigree Genetics Bio Lab Answers, especially related to Human Pedigree Genetics Bio Lab Answers, might be challenging as theyre often artistic creations rather than practical blueprints. However, you can explore the following steps to search for or create your own Online Searches: Look for websites, forums, or blogs dedicated to Human Pedigree Genetics Bio Lab Answers, Sometimes enthusiasts share their designs or concepts in PDF format. Books and Magazines Some Human Pedigree Genetics Bio Lab Answers books or magazines might include. Look for these in online stores or libraries. Remember that while Human Pedigree Genetics Bio Lab Answers, sharing copyrighted material without permission is not legal. Always ensure youre either creating your own or obtaining them from legitimate sources that allow sharing and downloading. Library Check if your local library offers eBook lending services. Many libraries have digital catalogs where you can borrow Human Pedigree Genetics Bio Lab Answers eBooks for free, including popular titles. Online Retailers: Websites like Amazon, Google Books, or Apple Books often sell eBooks. Sometimes, authors or publishers offer promotions or free periods for certain books. Authors Website Occasionally, authors provide excerpts or short stories for free on their websites. While this might not be the Human Pedigree Genetics Bio Lab Answers full book , it can give you a taste of the authors writing style. Subscription Services Platforms like Kindle Unlimited or Scribd offer subscription-based access to a wide range

of Human Pedigree Genetics Bio Lab Answers eBooks, including some popular titles.

FAQs About Human Pedigree Genetics Bio Lab Answers Books

1. Where can I buy Human Pedigree Genetics Bio Lab Answers books? Bookstores: Physical bookstores like Barnes & Noble, Waterstones, and independent local stores. Online Retailers: Amazon, Book Depository, and various online bookstores offer a wide range of books in physical and digital formats.
2. What are the different book formats available? Hardcover: Sturdy and durable, usually more expensive. Paperback: Cheaper, lighter, and more portable than hardcovers. E-books: Digital books available for e-readers like Kindle or software like Apple Books, Kindle, and Google Play Books.
3. How do I choose a Human Pedigree Genetics Bio Lab Answers book to read? Genres: Consider the genre you enjoy (fiction, non-fiction, mystery, sci-fi, etc.). Recommendations: Ask friends, join book clubs, or explore online reviews and recommendations. Author: If you like a particular author, you might enjoy more of their work.
4. How do I take care of Human Pedigree Genetics Bio Lab Answers books? Storage: Keep them away from direct sunlight and in a dry environment. Handling: Avoid folding pages, use bookmarks, and handle them with clean hands. Cleaning: Gently dust the covers and pages occasionally.
5. Can I borrow books without buying them? Public Libraries: Local libraries offer a wide range of books for borrowing. Book Swaps: Community book exchanges or online platforms where people exchange books.
6. How can I track my reading progress or manage my book collection? Book Tracking Apps: Goodreads, LibraryThing, and Book Catalogue are popular apps for tracking your reading progress and managing book collections. Spreadsheets: You can create your own spreadsheet to track books read, ratings, and other details.
7. What are Human Pedigree Genetics Bio Lab Answers audiobooks, and where can I find them? Audiobooks: Audio recordings of books, perfect for listening while commuting or multitasking. Platforms: Audible, LibriVox, and Google Play Books offer a wide selection of audiobooks.
8. How do I support authors or the book industry? Buy Books: Purchase books from authors or independent bookstores. Reviews: Leave reviews on platforms like Goodreads or Amazon. Promotion: Share your favorite books on social media or recommend them to friends.
9. Are there book clubs or reading communities I can join? Local Clubs: Check for local book clubs in libraries or community centers. Online Communities: Platforms like Goodreads have virtual book clubs and discussion groups.

10. Can I read Human Pedigree Genetics Bio Lab Answers books for free? Public Domain Books: Many classic books are available for free as they're in the public domain. Free E-books: Some websites offer free e-books legally, like Project Gutenberg or Open Library.

Find Human Pedigree Genetics Bio Lab Answers :

[compression properties astm d695 iso 604 intertek](#)

[comptia a certification sample question papers and with answers the complete brain dumps style study for exam code 220 801 220 802 part 1 2](#)

[complex variables and applications solution manual churchill](#)

[comsol server manual comsol multiphysics](#)

[collins revision ks3 science l5 7 revision guide workbook practice papers levels 5 7 by unknown on 02012009 unknown edition](#)

complete acoustic guitar method complete edition book cd

[complaint resolution form takaful emarat](#)

[computer system architecture morris mano third edition](#)

complaint for absolute divorce cc dr 020

[communication embracing difference](#)

[coming of age the education and development of young adolescents a resource for educators and parents](#)

[computer science illuminated sixth edition includes navigate 2 advantage access](#)

[concept development practice page 33 2 answers](#)

comentario biblico mundo hispano tomo 21 scribd com

[construction safety quiz questions with answers](#)

Human Pedigree Genetics Bio Lab Answers :

vauxhall vivaro 2009 2015 haynes repair manuals guides - Oct 26 2022

web oct 30 2020 for instance the wiring loom diagram outlines the various electrical components and circuits of the vauxhall vivaro including the engine control unit the

vivaro wiring diagram free download - Jun 02 2023

web feb 11 2018 detailed description vauxhall opel vivaro repair manual includes step by step instructions with detailed

illustrations drawings diagrams and the explanations

wiring diagram vauxhall vivaro wiring flow schema - Feb 15 2022

web nissan primastar opel vivaro renault trafic service manual wiring diagram this manual contains maintenance and repair procedures for 2002 nissan primastar

list of contents 2 chassis number and identification plate 2 - Apr 19 2022

web oct 15 2021 sel injector repair wiring loom plug connector for vauxhall vivaro 1 9 cdti banggood usa sold out arrival notice sportissimo html conversion guideline

vivaro engine and sensor wiring diagram vauxhall owners - Aug 04 2023

web 1 oct 22 2021 hi having done a search of the forum i can see that vivaro engine wiring diagrams are hard if not impossible to find looking on ebay etc i can see there are

[wiring diagram vauxhall vivaro wiring work](#) - Jul 23 2022

web mar 11 2012 on this website you find fuse box diagram and description for vauxhall vivaro autogenius info category vauxhall vivaro vauxhall

[vivaro wiring diagram free download schematron org](#) - Oct 06 2023

web jan 13 2023 vauxhall vivaro engine wiring diagram keywords vauxhall opel vivaro repair manual i ncludes step by step instructions with detailed illustrations drawings

wiring diagram for vauxhall vivaro diagram circuit - Nov 26 2022

web comfort wiring diagrams clear localised wiring schematics for key vehicle features with wire and component trace functionality for fast efficient first time fixes includes

wiring diagram vauxhall vivaro diagram circuit - Feb 27 2023

web jul 1 2022 the vauxhall vivaro s wiring diagram is complex yet intricate and very specific it details each wire s purpose and shows the location of certain components

vauxhall vivaro engine diagram fixya - Jun 21 2022

web do you own a vauxhall vivaro or plan to buy one then you need to download the owner s manual for free from this webpage it contains all the essential information and

wiring diagram vauxhall vivaro wiring digital and schematic - Sep 05 2023

web may 5 2021 when looking for a wiring diagram for your vauxhall vivaro it s important to find the exact diagram for your specific model and year many of the diagrams available

opel vivaro repair service manuals 76 pdf s - May 01 2023

web 9 99 get your hands on the complete opel factory workshop software download now other manuals 184 pages opel vivaro

owners manual 2008 2008 view pdf brochure 17

electrical wiring diagrams for opel vivaro download free - Aug 24 2022

web nov 24 2022 the engine bay wiring diagram is the most complex section of the entire wiring diagram it outlines all the different components and connections associated with

owner s manual vivaro vauxhall - May 21 2022

web the origin of the reference system is the centre of the front axle as shown in the diagram below the position of the front axle is constant with a deviation of 1 mm along the x

vauxhall vivaro service repair manuals free pdf - Jan 17 2022

vauxhall vivaro wiring loom diagram - Sep 24 2022

web electrical wiring diagrams for opel vivaro 36 6 mb year 2014 pages 86 format jpg language russian file size 36 6 mb

electrical wiring diagrams for opel vivaro

wiring diagram vauxhall vivaro wiring flow line - Mar 19 2022

web apr 5 2022 the ignition switch is where the ignition key is inserted which then initiates the engine after the ignition switch the fuses are the next component in the wiring

wiring diagram for vauxhall vivaro - Jul 03 2023

web apr 12 2021 it shows how the wiring harnesses connectors and components work together knowing this information can make diagnosing and repairing issues much

vivaro van wiring diagram wiring diagram - Jan 29 2023

web jan 13 2023 the wiring diagram for the vauxhall vivaro allows you to see how all the electrical components are connected and how they interact with each other the wiring

wiring diagram for vauxhall vivaro wiring boards - Dec 28 2022

web oct 30 2022 companies like bosch and obdii offer high quality wiring diagrams specifically designed for vauxhall vivaro vehicles they provide a detailed and easy to

traffic vivaro m9r wiring diagram independent renault forums - Mar 31 2023

web aug 1 2018 hi all my 2007 m9r story so far after replacing two seized injectors later the van is still not running right it is currently showing a map sensor fault p0235 after

distributed algorithms the morgan kaufmann series in data - Jul 01 2022

web distributed algorithms is written by nancy a lynch and published by morgan kaufmann the digital and etextbook isbn for distributed algorithms are

distributed algorithms 1st edition elsevier - Sep 03 2022

web hardcover isbn 10 1558603484 isbn 13 9781558603486 publisher morgan kaufmann 1996 view all copies of this isbn
edition synopsis about this title in distributed

[distributed algorithms the morgan kaufmann series in data](#) - Aug 02 2022

web the primary source will be the book distributed algorithms by prof nancy lynch lynch lynch nancy distributed algorithms
burlington ma morgan kaufmann

[distributed algorithms the morgan kaufmann series in](#) - Aug 14 2023

web in distributed algorithms nancy lynch provides a blueprint for designing implementing and analyzing distributed
algorithms she directs her book at a wide audience

distributed algorithms 9781558603486 9780080504704 - Apr 29 2022

web 1b concurrency control algorithms for nested transactions lynch merritt weihl fekete atomic transactions in concurrent
distributed systems morgan kaufmann

[distributed algorithms by nancy a lynch ebook ebooks com](#) - Nov 24 2021

distributed algorithms nancy a lynch google books - May 11 2023

web by lynch nancy a nancy ann 1948 publication date 1996 topics computer algorithms electronic data processing
distributed processing publisher san

distributed algorithms book o reilly media - Mar 09 2023

web in distributed algorithms nancy lynch provides a blueprint for designing implementing and analyzing distributed
algorithms she directs her book at a wide audience

distributed algorithms the morgan kaufmann series in data - Dec 26 2021

web nancy lynch distributed algorithms morgan kaufmann introduction to distributed self stabilizing algorithms apr 13 2021
this book aims at being a comprehensive and

distributed algorithms by nancy a lynch open library - Oct 04 2022

web apr 16 1996 in distributed algorithms nancy lynch provides a blueprint for designing implementing and analyzing
distributed algorithms she directs her book at a wide

a theoretical view of distributed systems nsf - Feb 25 2022

web apr 16 1996 distributed algorithms the morgan kaufmann series in data management systems ebook lynch nancy a
amazon co uk kindle store

[distributed algorithms guide books acm digital library](#) - Feb 08 2023

web distributed algorithms the morgan kaufmann series in data management systems lynch nancy a amazon com tr kitap
[distributed algorithms the morgan kaufmann series in data](#) - Jan 07 2023

web apr 16 1996 distributed algorithms the morgan kaufmann series in data management systems hardcover 16 april 1996
by nancy a lynch author

distributed algorithms gbv - Mar 29 2022

web distributed algorithms by nancy a lynch get full access to distributed algorithms and 60k other titles with a free 10 day
trial of o reilly there are also live events courses

title page distributed algorithms book o reilly media - Jan 27 2022

web in distributed algorithms nancy lynch provides a blueprint for designing implementing and analyzing distributed
algorithms she directs her book at a wide audience

distributed algorithms guide books acm digital library - Jul 13 2023

web apr 16 1996 elsevier apr 16 1996 computers 904 pages in distributed algorithms nancy lynch provides a blueprint for
designing implementing and analyzing

distributed algorithms nancy a lynch google books - Jun 12 2023

web morgan kaufmann 1996 computers 872 pages in distributed algorithms nancy lynch provides a blueprint for designing
implementing and analyzing distributed

distributed algorithms massachusetts institute of - Nov 05 2022

web mar 1 1996 in distributed algorithms nancy lynch provides a blueprint for designing implementing and analyzing
distributed algorithms she directs her book at a wide

readings distributed algorithms mit opencourseware - May 31 2022

web nancy a lynch morgan kaufmann publishers inc san francisco california contents preface introduction 1 1 the subject
matter 1 2 our viewpoint 1 3 overview of chapters

distributed algorithms lynch nancy a nancy ann 1948 - Apr 10 2023

web in distributed algorithms nancy lynch provides a blueprint for designing implementing and analyzing distributed
algorithms she directs her book at a wide audience

nancy lynch distributed algorithms morgan kaufmann 2023 - Oct 24 2021

distributed algorithms the morgan kaufmann series in - Dec 06 2022

web nov 26 2020 distributed algorithms by nancy a lynch 1996 morgan kaufmann publishers edition in english

top 10 cswa exam tips to help you pass on your first try - Feb 13 2023

web may 28 2021 by madie norris forcier before you begin your cswa exam practice there are a few things you need to know the certified solidworks associate cswa exam tests your basic knowledge of solidworks the cswa exam is the first of three solidworks certification levels

cswa exam practice problems solidworks - Apr 15 2023

web cswa exam practice problems educators use the cswa practice problems to aid in the teaching of 3d modeling and best practices and to prepare students to take the cswa exam

cswa sample exam solidworks - Aug 19 2023

web cswa sample exam the cswa is intended for a student with a minimum of six to nine months of solidworks experience and basic knowledge of engineering and fundamentals and practices

solidworks certification exam guide practice test - May 16 2023

web cswp exam details each of the three segments are purchased as separate exam credits they may be purchased as a three part bundle and are taken in separate sittings total exam length 3 hours 20 minutes all segments

official certified solidworks associate cswa examination guide - Jan 12 2023

web there are two questions on the cswa exam in the basic part creation and modification category one question is in a multiple choice single answer format and the other question modification of the model is in the fill in the blank format each question is worth fifteen 15 points for a total of thirty 30 points

certified solidworks associate cswa - Mar 14 2023

web cswa sample exam questions page 4 question 4 build this assembly in solidworks it contains 3 machined brackets and 2 pins brackets 2mm thickness and equal size holes through all material 6061 alloy density 0 0027g mm 3 the top edge of the notch is located 20 mm from the top

top solidworks cswa exam faqs solidprofessor - Sep 08 2022

web the cswa exam includes 14 questions that are worth a total of 240 points the exam is broken down into three topics part modeling assembly modeling and drafting you need to get a 70 on the cswa exam to become a certified solidworks associate

certified solidworks associate cswp academic exam - Feb 01 2022

web students must have cswa academic certification 30 days prior to taking the cswp academic exam the cswp academic exam is provided in the following languages english french german italian korean spanish chinese s chinese t japanese and brazilian portuguese sample cswp exam pdf taking the exam

solidworks certification exam guide practice test - Sep 20 2023

web the cswa exam is administered through the tangix testerpro client an application that you may download from the solidworks virtualtester website the sample exam in this packet can also be taken in the tangix testerpro client

cswa practice exams mysolidworks training - Dec 11 2022

web cswa practice exams mysolidworks training overview catalog technical sessions training manuals cswa practice exams you need to log in or have an account to play all the lessons log in or join review the part and assembly practice exams to prepare for the cswa exam updated 8 years ago

certified solidworks associate cswa sample exam questions - Jul 06 2022

web sample exam questions the questions below represent sample cswa exam questions part modeling and assembly modeling questions that require you to build model should be correctly answered in 45 minutes or less question 2 and question 3 should be correctly answered in 5 minutes or less

cswa sample part exercise mysolidworks training - Apr 03 2022

web explore the part modeling portion of the cswa exam review the techniques used to model the part in the sample cswa exam review the sample cswa exam

official guide to certified solidworks associate exams sdc - May 04 2022

web part 1 of the cswa academic exam is 90 minutes minimum passing score is 80 with 6 questions there are two questions in the basic part creation and modification category two questions in the intermediate part creation and modification category and two questions in the assembly creation and modification category

full practice cswa exam certified solidworks associate - Aug 07 2022

web this practice test is made to prepare you for the solidworks official associate certification exam the unique questions in the test will provide you with a realistic experience of the actual exam so if you are wondering whether or not you are ready for the cswa exam you can try here first

training mysolidworks official solidworks community - Nov 10 2022

web training catalog sort by relevance learning type learning paths 2 access level standard 2 cswa practice exercises this learning path contains exercises so you can improve your proficiency with the solidworks cad software before taking the certified solidworks associate cswa exam

how to prepare for the cswa exam tips for how to practice for the cswa exam - Oct 09 2022

web sample exams and additional practice exercises practice with solidworks cswa sample exam questions hands on experience is key the more you can familiarize your self with the features and tools beforehand the less time you ll waste trying to find the right functionalities during the exam take the cswa for free

solidworks certification exam guide practice test - Jun 17 2023

web this guide contains information advice and practice for becoming a certified solidworks associate here you will find an overview of solidworks certifications details about the cswa exam advice on preparing for and taking the cswa exam a

