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AZ-301

Microsoft Azure Architect Design

Testlet 1

Case study

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Overview

Existing Environment

Active Directory Environment

The network contains two Active Directory forests named corp.fabrikam.com and rd.fabrikam.com. There are no trust relationships between the forests.

Corp.fabrikam.com is a production forest that contains identities used for internal user and computer authentication.

Rd.fabrikam.com is used by the research and development (R&D) department only.

Network Infrastructure

Each office contains at least one domain controller from the corp.fabrikam.com domain. The main office contains all the domain controllers for the rd.fabrikam.com forest.

All the offices have a high-speed connection to the Internet.

An existing application named WebApp1 is hosted in the data center of the London office. WebApp1 is used by customers to place and track orders.

WebApp1 has a web tier that uses Microsoft Internet Information Services (IIS) and a database tier that runs Microsoft SQL Server 2016. The web tier and the database tier are deployed to virtual machines that run on Hyper-V.

The IT department currently uses a separate Hyper-V environment to test updates to WebApp1.

Fabrikam purchases all Microsoft licenses through a Microsoft Enterprise Agreement that includes Software Assurance.

Problem Statements

The use of Web App1 is unpredictable. At peak times, users often report delays. At other times, many resources for WebApp1 are underutilized.

Requirements

Planned Changes

Fabrikam plans to move most of its production workloads to Azure during the next few years.

As one of its first projects, the company plans to establish a hybrid identity model, facilitating an upcoming Microsoft Office 365 deployment.

All R&D operations will remain on-premises.

Fabrikam plans to migrate the production and test instances of WebApp1 to Azure.

Technical Requirements

Fabrikam identifies the following technical requirements:

▪ Web site content must be easily updated from a single point.
▪ User input must be minimized when provisioning new app instances.
▪ Whenever possible, existing on-premises licenses must be used to reduce cost. ▪
Users must always authenticate by using their corp.fabrikam.com UPN identity.
▪ Any new deployments to Azure must be redundant in case an Azure region fails.
▪ Whenever possible, solutions must be deployed to Azure by using platform as a service (PaaS).
▪ An email distribution group named IT Support must be notified of any issues relating to the directory synchronization services.
▪ Directory synchronization between Azure Active Directory (Azure AD) and corp.fabrikam.com must not be affected by a link failure between Azure and the onpremises network.

Database Requirements

Fabrikam identifies the following database requirements:

▪ Database metrics for the production instance of WebApp1, must be available for analysis so that database administrators can optimize the performance settings.

▪ To avoid disrupting customer access, database downtime must be minimized when databases are migrated. ▪
Database backups must be retained for a minimum of seven years to meet compliance requirements.

Security Requirements

Fabrikam identifies the following security requirements:

▪ Company information including policies, templates, and data must be inaccessible to anyone outside the company.
▪ Users on the on-premises network must be able to authenticate to corp.fabrikam.com if an Internet link fails.
▪ Administrators must be able authenticate to the Azure portal by using their corp.fabrikam.com credentials.
▪ All administrative access to the Azure portal must be secured by using multi-factor authentication. ▪
The testing of WebApp1 updates must not be visible to anyone outside the company.

QUESTION 1
What should you include in the identity management strategy to support the planned changes?

A. Move all the domain controllers from corp.fabrikam.com to virtual networks in Azure.
B. Deploy domain controllers for corp.fabrikam.com to virtual networks in Azure.
C. Deploy a new Azure AD tenant for the authentication of new R&D projects.
D. Deploy domain controllers for the rd.fabrikam.com forest to virtual networks in Azure.

Correct Answer: B
Section: [none]
Explanation

Explanation/Reference:
Explanation:
Directory synchronization between Azure Active Directory (Azure AD) and corp.fabrikam.com must not be affected by a link failure between Azure and the onpremises network. (This requires domain controllers in Azure)
Users on the on-premises network must be able to authenticate to corp.fabrikam.com if an Internet link fails. (This requires domain controllers on-premises)
Question Set 2

QUESTION 1
Note: This question is part of series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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You have an Azure subscription named Project1. Only a group named Project1admins is assigned roles in the Project1 subscription. The Project1 subscription contains all the resources for an application named Application1.

Your company is developing a new application named Application2. The members of the Application2 development team belong to an Azure Active Directory (Azure AD) group named App2Dev.

You identify the following requirements for Application2:

▪ The members of App2Dev must be prevented from changing the role assignments in Azure.
▪ The members of App2Dev must be able to create new Azure resources required by Application2.
▪ All the required role assignments for Application2 will be performed by the members of Project1admins.

You need to recommend a solution for the role assignments of Application2.

Solution: Create a new Azure subscription named Project2. Assign Project1admins the User Access Administrator role for the Project2 subscription. Assign App2Dev the Owner role for the Project2 subscription.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: [none]
Explanation

Explanation/Reference:

QUESTION 2
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▪ The members of App2Dev must be able to create new Azure resources required by Application2.
▪ All the required role assignments for Application2 will be performed by the members of Project1admins.

You need to recommend a solution for the role assignments of Application2.

Solution: In Project1, create a resource group named Application2RG. Assign Project1admins the Owner role for Application2RG. Assign App2Dev the Contributor role for Application2RG.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: [none]
Explanation

Explanation/Reference:

QUESTION 3
Note: This question is part of series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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You have an Azure subscription that contains a resource group named RG1.

You create an Azure Active Directory (Azure AD) group named ResearchUsers that contains the user accounts of all researchers.

You need to recommend a solution that meets the following requirements:

▪ The researchers must be allowed to create Azure virtual machines.
▪ The researchers must only be able to create Azure virtual machines by using specific Azure Resource Manager templates.

Solution: Create an Azure DevOps Project. Configure the DevOps Project settings.

Does this meet the goal?

A. Yes
B. No

Correct Answer: B
Section: [none]
Explanation

Explanation/Reference:

QUESTION 4
Note: This question is part of series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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You create an Azure Active Directory (Azure AD) group named ResearchUsers that contains the user accounts of all researchers.

You need to recommend a solution that meets the following requirements:

▪ The researchers must be allowed to create Azure virtual machines.
▪ The researchers must only be able to create Azure virtual machines by using specific Azure Resource Manager templates.

Solution: On RG1, assign the Contributor role to the ResearchUsers group. Create a custom Azure Policy definition and assign the policy to RG1.

Does this meet the goal?

A. Yes
B. No

Correct Answer: A
Section: [none]
Explanation

Explanation/Reference:

QUESTION 5
A company named Contoso Ltd., has a single-domain Active Directory forest named contoso.com.

Contoso is preparing to migrate all workloads to Azure. Contoso wants users to use single sign-on (SSO) when they access cloud-based services that integrate with Azure Active Directory (Azure AD).

You need to identify any objects in Active Directory that will fail to synchronize to Azure AD due to formatting issues. The solution must minimize costs.

What should you include in the solution?

A. Azure Advisor
B. Microsoft Office 365 IdFix
C. Azure AD Connect Health
D. Password Export Server version 3.1 (PES v3.1) in Active Directory Migration Tool (ADMT)

Correct Answer: B
Section: [none]
Explanation

Explanation/Reference:

QUESTION 6
HOTSPOT

Your company has an API that returns XML data to internal applications.

You plan to migrate the applications to Azure. You also plan to allow the company's partners to access the API.

You need to recommend an API management solution that meets the following requirements:

▪ Internal applications must receive data in the JSON format once the applications migrate to Azure.
▪ Partner applications must have their header information stripped before the applications receive the data.

What should you include in the recommendation? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

Answer Area

Minimum number of APIs to add to Azure API Management:	▼
	1
	2
	3

Minimum number of products to publish in Azure API Management:	▼
	1
	2
	3

Minimum number of policy elements to add:	▼
	1
	2
	3

Correct Answer:

Answer Area

Minimum number of APIs to add to Azure API Management:

▼
1
2
3

Minimum number of products to publish in Azure API Management:

▼
1
2
3

Minimum number of policy elements to add:

▼
1
2
3

Section: [none]
Explanation

Explanation/Reference:
References: https://docs.microsoft.com/en-us/azure/api-management/api-management-howto-add-

products https://docs.microsoft.com/en-us/azure/api-management/api-management-howto-policies

https://docs.microsoft.com/en-us/azure/api-management/transform-api

QUESTION 7
You have an Azure subscription.

You need to recommend a solution to provide developers with the ability to provision Azure virtual machines. The solution must meet the following requirements:

▪ Only allow the creation of the virtual machines in specific regions. ▪
Only allow the creation of specific sizes of virtual machines.

What should include in the recommendation?

A. conditional access policies
B. Azure Policy
C. Azure Resource Manager templates
D. role-based access control (RBAC)

Correct Answer: B
Section: [none]
Explanation

Explanation/Reference:

QUESTION 8
Your network contains an on-premises Active Directory forest.

You discover that when users change jobs within your company, the membership of the user groups are not being updated. As a result, the users can access resources that are no longer relevant to their job.

You plan to integrate Active Directory and Azure Active Directory (Azure AD) by using Azure AD Connect.

You need to recommend a solution to ensure that group owners are emailed monthly about the group memberships they manage.

What should you include in the recommendation?

A. Azure AD access reviews
B. Tenant Restrictions
C. Azure AD Identity Protection

D. conditional access policies

Correct Answer: A
Section: [none]
Explanation

Explanation/Reference:
References: https://docs.microsoft.com/en-us/azure/active-directory/governance/access-reviews-overview

QUESTION 9
A company named Contoso, Ltd. has an Azure Active Directory (Azure AD) tenant that is integrated with Microsoft Office 365 and an Azure subscription.

Contoso has an on-premises identity infrastructure. The infrastructure includes servers that run Active Directory Domain Services (AD DS), Active Directory Federation Services (AD FS), Azure AD Connect, and Microsoft Identity Manager (MIM).

Contoso has a partnership with a company named Fabrikam, Inc. Fabrikam has an Active Directory forest and an Office 365 tenant. Fabrikam has the same onpremises identity infrastructure as Contoso.

A team of 10 developers from Fabrikam will work on an Azure solution that will be hosted in the Azure subscription of Contoso. The developers must be added to the Contributor role for a resource in the Contoso subscription.

You need to recommend a solution to ensure that Contoso can assign the role to the 10 Fabrikam developers. The solution must ensure that the Fabrikam developers use their existing credentials to access resources.

What should you recommend?

A. Configure a forest trust between the on-premises Active Directory forests of Contoso and Fabrikam.
B. Configure an organization relationship between the Office 365 tenants of Fabrikam and Contoso.
C. In the Azure AD tenant of Contoso, enable Azure Active Directory Domain Services (Azure AD DS). Create a one-way forest trust that uses selective authentication between the Active Directory forests of Contoso and Fabrikam.
D. In the Azure AD tenant of Contoso, create guest accounts for the Fabrikam developers.

Correct Answer: D
Section: [none]
Explanation

Explanation/Reference:
References: https://docs.microsoft.com/en-us/azure/role-based-access-control/role-assignments-external-users **QUESTION 10**
You have a hybrid deployment of Azure Active Directory (Azure AD).

You need to recommend a solution to ensure that the Azure AD tenant can be managed only from the computers on your on-premises network.

What should you include in the recommendation?

A. Azure AD roles and administrators
B. a conditional access policy
C. Azure AD Application Proxy
D. Azure AD Privileged Identity Management

Correct Answer: B
Section: [none]
Explanation

Explanation/Reference:

Testlet 1

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Contoso, Ltd. is a US-based financial services company that has a main office in New York and a branch office in San Francisco.

Existing Environment

Payment Processing System

Contoso hosts a business-critical payment processing system in its New York data center. The system has three tiers: a front-end web app, a middle-tier web API, and a back-end data store implemented as a Microsoft SQL Server 2014 database. All servers run Windows Server 2012 R2.

The front-end and middle-tier components are hosted by using Microsoft Internet Information Services (IIS). The application code is written in C# and ASP.NET. The middle-tier API uses the Entity Framework to communicate to the SQL Server database. Maintenance of the database is performed by using SQL Server Agent jobs.

The database is currently 2 TB and is not expected to grow beyond 3 TB.

The payment processing system has the following compliance-related requirements:

▪ Encrypt data in transit and at rest. Only the front-end and middle-tier components must be able to access the encryption keys that protect the data store.
▪ Keep backups of the data in two separate physical locations that are at least 200 miles apart and can be restored for up to seven years.
▪ Support blocking inbound and outbound traffic based on the source IP address, the destination IP address, and the port number.

- Collect Windows security logs from all the middle-tier servers and retain the logs for a period of seven years.
- Inspect inbound and outbound traffic from the front-end tier by using highly available network appliances. ▪
Only allow all access to all the tiers from the internal network of Contoso.

Tape backups are configured by using an on-premises deployment of Microsoft System Center Data Protection Manager (DPM), and then shipped offsite for long term storage.

Historical Transaction Query System

Contoso recently migrated a business-critical workload to Azure. The workload contains a .NET web service for querying the historical transaction data residing in Azure Table Storage. The .NET web service is accessible from a client app that was developed in-house and runs on the client computers in the New York office. The data in the table storage is 50 GB and is not expected to increase.

Current Issues

The Contoso IT team discovers poor performance of the historical transaction query system, at the queries frequently cause table scans.

Requirements

Planned Changes

Contoso plans to implement the following changes:

- Migrate the payment processing system to Azure.
- Migrate the historical transaction data to Azure Cosmos DB to address the performance issues. **Migration**

Requirements

Contoso identifies the following general migration requirements:

- Infrastructure services must remain available if a region or a data center fails. Failover must occur without any administrative intervention.
- Whenever possible, Azure managed services must be used to minimize management overhead. ▪
Whenever possible, costs must be minimized.

Contoso identifies the following requirements for the payment processing system:

- If a data center fails, ensure that the payment processing system remains available without any administrative intervention. The middle-tier and the web front end must continue to operate without any additional configurations.
- Ensure that the number of compute nodes of the front-end and the middle tiers of the payment processing system can increase or decrease automatically based on CPU utilization.
- Ensure that each tier of the payment processing system is subject to a Service Level Agreement (SLA) of 99.99 percent availability.

▪ Minimize the effort required to modify the middle-tier API and the back-end tier of the payment processing system.

▪ Generate alerts when unauthorized login attempts occur on the middle-tier virtual machines.
▪ Ensure that the payment processing system preserves its current compliance status. ▪
Host the middle tier of the payment processing system on a virtual machine.

Contoso identifies the following requirements for the historical transaction query system:

▪ Minimize the use of on-premises infrastructure services.
▪ Minimize the effort required to modify the .NET web service querying Azure Cosmos DB.
▪ Minimize the frequency of table scans.
▪ If a region fails, ensure that the historical transactions query system remains available without any administrative intervention.

Information Security Requirements

The IT security team wants to ensure that identity management is performed by using Active Directory. Password hashes must be stored on-premises only.

Access to all business-critical systems must rely on Active Directory credentials. Any suspicious authentication attempts must trigger a multi-factor authentication prompt automatically. legitimate users must be able to authenticate successfully by using multi-factor authentication.

QUESTION 1
You need to recommend a solution for implementing the back-end tier of the payment processing system in Azure.

What should you include in the recommendation?

A. an Azure SQL Database managed instance
B. a SQL Server database on an Azure virtual machine
C. an Azure SQL Database single database
D. an Azure SQL Database elastic pool

Correct Answer: C
Section: [none]
Explanation

Explanation/Reference:
Question Set 2

QUESTION 1

You are developing a sales application that will contain several Azure cloud services and will handle different components of a transactions. Different cloud services will process customer orders, billing, payment, inventory, and shipping.

You need to recommend a solution to enable the cloud services to asynchronously communicate transaction information by using REST messages.

What would you include in the recommendation?

A. Traffic Manager
B. Azure Notification Hubs
C. Azure Blob storage
D. Azure Queue storage

Correct Answer: D
Section: [none]
Explanation

Explanation/Reference:

QUESTION 2
You have an Azure subscription that contains an Azure Cosmos DB account.

You need to recommend a solution to generate an alert from Azure Log Analytics when a request charge for a query exceeds 50 request units more than 20 times within a 15-minute window.

What should you recommend?

A. Create a search query to identify when requestCharge_s exceeds 50. Configure an alert threshold of 20 and a period of 15.
B. Create a search query to identify when duration_s exceeds 20 and requestCharge_s exceeds 50. Configure a period of 15.
C. Create a search query to identify when requestCharge_s exceeds 20. Configure a period of 15 and a frequency of 20.
D. Create a search query to identify when duration_s exceeds 20. Configure a period of 15.

Correct Answer: A
Section: [none]
Explanation

Explanation/Reference:
QUESTION 3
You are designing a data protection strategy for Azure virtual machines. All the virtual machines are in the Standard tier and use managed disks.

You need to recommend a solution that meets the following requirements:

- The use of encryption keys is audited.
- All the data is encrypted at rest always.
- You manage the encryption keys, not Microsoft.

What should you include in the recommendation?

A. BitLocker Drive Encryption (BitLocker)
B. Azure Storage Service Encryption
C. client-side encryption
D. Azure Disk Encryption

Correct Answer: D
Section: [none]
Explanation

Explanation/Reference:
References: https://docs.microsoft.com/en-us/azure/security/azure-security-disk-encryption-overview

QUESTION 4
You have 100 servers that run Windows Server 2012 R2 and host Microsoft SQL Server 2012 R2 instances. The instances host databases that have the following characteristics:

- The largest database is currently 3 TB. None of the databases will ever exceed 4 TB. ▪ Stored procedures are implemented by using CLR.

You plan to move all the data from SQL Server to Azure.

You need to recommend an Azure service to host the databases. The solution must meet the following requirements:

- Whenever possible, minimize management overhead for the migrated databases.
- Minimize the number of database changes required to facilitate the migration.
- Ensure that users can authenticate by using their Active Directory credentials.

What should you include in the recommendation?

A. Azure SQL Database single databases
B. Azure SQL Database Managed Instance
C. Azure SQL Database elastic pools
D. SQL Server 2016 on Azure virtual machines

Correct Answer: B
Section: [none]
Explanation

Explanation/Reference:
References: https://docs.microsoft.com/en-us/azure/sql-database/sql-database-managed-instance

QUESTION 5
You plan to create an Azure Cosmos DB account that uses the SQL API. The account will contain data added by a web application. The web application will send data daily.

You need to recommend a notification solution that meets the following requirements:

▪ Sends email notification when data is received from IoT devices. ▪
Minimizes compute cost.

What should you include in the recommendation?

A. Deploy an Azure logic app that has the Azure Cosmos DB connector configured to use a SendGrid action.
B. Deploy a function app that is configured to use the Consumption plan and a SendGrid binding.

C. Deploy an Azure logic app that has a SendGrid connector configured to use an Azure Cosmos DB action.
D. Deploy a function app that is configured to use the Consumption plan and an Azure Event Hubs binding.

Correct Answer: B
Section: [none]
Explanation

Explanation/Reference:

QUESTION 6
You have Azure virtual machines that run a custom line-of-business web application.

You plan to use a third-party solution to parse event logs from the virtual machines stored in an Azure storage account.

You need to recommend a solution to save the event logs from the virtual machines to the Azure Storage account. The solution must minimize costs and complexity.

What should you include in the recommendation?

A. Azure VM Diagnostics Extension
B. Azure Monitor
C. event log subscriptions
D. Azure Log Analytics

Correct Answer: A
Section: [none]
Explanation

Explanation/Reference:
References:
https://docs.microsoft.com/en-us/azure/virtual-machines/windows/extensions-diagnostics

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▪ Inspect inbound and outbound traffic from the front-end tier by using highly available network appliances. ▪
Only allow all access to all the tiers from the internal network of Contoso.

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- Minimize the effort required to modify the .NET web service querying Azure Cosmos DB.
- Minimize the frequency of table scans.
- If a region fails, ensure that the historical transactions query system remains available without any administrative intervention.

Information Security Requirements

The IT security team wants to ensure that identity management is performed by using Active Directory. Password hashes must be stored on-premises only.

Access to all business-critical systems must rely on Active Directory credentials. Any suspicious authentication attempts must trigger a multi-factor authentication prompt automatically. legitimate users must be able to authenticate successfully by using multi-factor authentication.

QUESTION 1
You need to recommend a backup solution for the data store of the payment processing system.

What should you include in the recommendation?

A. Microsoft System Center Data Protection Manager (DPM)
B. long-term retention
C. Azure Backup Server
D. a Recovery Services vault

Correct Answer: B
Section: [none]
Explanation

Explanation/Reference:
References: https://docs.microsoft.com/en-us/azure/sql-database/sql-database-long-term-backup-retention-configure

QUESTION 2
You need to recommend a disaster recovery solution for the back-end tier of the payment processing system.

What should you include in the recommendation?

A. Always On Failover Cluster Instances
B. active geo-replication
C. Azure Site Recovery
D. an auto-failover group

Correct Answer: D
Section: [none]
Explanation

Explanation/Reference:
References:
https://docs.microsoft.com/en-us/azure/sql-database/sql-database-auto-failover-group

Question Set 2

QUESTION 1
You plan to use Azure Site Recovery to protect several on-premises physical server workloads. Each server workload is independent of the other. The workloads are stateless.

You need to recommend a failover strategy to ensure that if the on-premises data center fails, the workloads are available in Azure as quickly as possible.

Which failover strategy should you include in the recommendation?

A. Latest
B. Latest app-consistent

C. Latest multi-VM processed
D. Latest processed

Correct Answer: D
Section: [none]
Explanation

Explanation/Reference:
References:
https://docs.microsoft.com/en-us/azure/site-recovery/site-recovery-failover

QUESTION 2
You plan to move a web application named App1 from an on-premises data center to Azure.

App1 depends on a custom framework that is installed on the host server.

You need to recommend a solution to host App1 in Azure. The solution must meet the following requirements:

▪ App1 must be available to users if an Azure data center becomes unavailable. ▪
Costs must be minimized.

What should you include in the recommendation?

A. In two Azure regions, deploy a Traffic Manager profile and a web app.
B. In two Azure regions, deploy a load balancer and a virtual machine scale set.
C. Deploy a load balancer and a virtual machine scale set across two availability zones.
D. In two Azure regions, deploy a load balancer and a web app.

Correct Answer: A
Section: [none]
Explanation

Explanation/Reference:

QUESTION 3
You plan to deploy a payroll system to Azure. The payroll system will use Azure virtual machines that run SUSE Linux Enterprise Server and Windows.

You need to recommend a business continuity solution for the payroll system. The solution must meet the following requirements:

- Minimize costs.
- Provide business continuity if an Azure region fails.
- Provide a recovery time objective (RTO) of 30 minutes.
- Provide a recovery point objective (RPO) of five minutes.

What should you include in the recommendation?

A. Microsoft System Center Data Protection Manager (DPM)
B. Azure Site Recovery
C. unmanaged disks that use geo-redundant storage (GRS)
D. Azure Backup

Correct Answer: B
Section: [none]
Explanation

Explanation/Reference:

QUESTION 4
The accounting department at your company migrates to a new financial accounting software. The accounting department must keep file-based database backups for seven years for compliance purposes. It is unlikely that the backups will be used to recover data.

You need to move the backups to Azure. The solution must minimize costs.

Where should you store the backups?

A. Azure SQL Database

B. Azure Blob storage that uses the Archive tier
C. a Recovery Services vault
D. Azure Blob storage that uses the Cool tier

Correct Answer: B
Section: [none]

Explanation

Explanation/Reference: