

## C 2 The Money Market

By the end of this chapter you should be able to demonstrate an understanding of the domestic market for money and credit. You will be expected to be able to:

- identify the components of the money supply in New Zealand
- distinguish between real and nominal changes in the money supply
- describe the operation of the credit multiplier and the role banks play in the process of credit creation
- describe the functions of the Reserve Bank particularly the implementation of monetary policy
- recognise the assets and transactions demand for money
- apply supply and demand analysis to the money market
- recognise the effects of interest rate changes on consumption, investment, exchange rates and net exports.

### Evolution of Money

Goldsmiths used to act as custodians, issuing depositors a receipt for gold deposited for safe-keeping. Depositors soon realised that instead of returning to the goldsmith to withdraw gold for each transaction, they could use the bank receipts themselves, as notes. **Fractional banking** developed, making loans operable by cheque. Banks' cash (gold) reserves needed to only be a fraction of their liabilities or depositors' money, because only a percentage of depositors would reclaim gold at any one time.

### Functions of Money

Money is used to facilitate trade and acts as a **medium of exchange**. Money is a **store of value** because it can be saved to provide for consumption spending later. Money provides a **measure of value** to put a universally understood value on goods and services. Money allows for a system of credit to be accepted, a **standard for deferred payment**.

### Types of Money

Money is a financial asset and has many definitions depending on **liquidity**. Liquidity refers to the ability of a financial asset to be converted into cash, and be used as a means of exchange. These financial assets range from the perfectly liquid cash (notes and coins), transaction account balances, investment account balances, through debentures, bonds, shares, to real assets such as real estate, which is the least liquid.

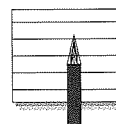
### Money Supply Aggregates

The **money supply** has some precise measures:

**M1** The narrow money supply  
Includes notes and coin and Transaction account balances operable by cheque

**M2** The near money supply  
Includes all of M1 and other on call accounts balances eg. savings and EFTPOS without penalties (but not operable by cheque)

**M3** The broad money supply  
Includes all of M2 and all types of accounts including term accounts with break penalties, but easily converted to cash.



1. EFTPOS
2. Fractional banking
3. Cheques
4. Old forms of money...stone circles etc.
5. Smart cards
6. Token money, notes and coins
7. Goldsmiths used to act as custodians
8. Commodity money
9. Precious metals
10. Credit cards
11. Gold coins
12. Barter

Reorder the numbers to suggest the most likely sequence to show the evolution of money.

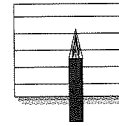
What are the functions of money?

Define liquidity.

Describe how the money supply aggregates reflect liquidity.

## Financial Intermediation

**Intermediation** enables the transfer of funds from those with surplus funds (savers) to those with a deficit (borrowers). It enables more saving, borrowing and investment and more efficiency, as there is no need for direct lending or borrowing.



Explain how a bank could help in the process of financial intermediation.

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## Real and Nominal Changes in the Money Supply (M)

Through the process of inflation or deflation the purchasing power of money will change. If M increases we need to know whether this will increase purchasing power or result in a decline in the value of money. We deflate the value of **nominal money supply** to give us the **real money supply** using the formula:

$$\text{Real Money Supply} = \text{Nominal Money Supply} \div \text{CPI}$$

The **equation of exchange** is  $MV = PY$  where:

M = the nominal supply of money

V = the velocity of circulation

P = the general price level

Y = the level of income.

If we assume that V and Y are constant, any change in M will lead to a change in P. The real money supply is therefore M/P. If prices double then M/P will halve.

Distinguish between the nominal and real money supply.

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## Changes in the Supply of Money

**Primary expansion** of the money supply will mean the banking system gains new reserves. It results from:

- customers banking more cash than they withdraw.
- government spending more money than it is raising from taxes (Budget deficit). This primary expansion can be removed if the government borrows from the public to fund this deficit.
- **Open market operations** (OMO). This is where the Reserve Bank of New Zealand (RBNZ) buys government stock from the public giving them the money in return for their stock.
- Overseas transactions with a *fixed exchange rate*, because export receipts had to be surrendered to RBNZ, which increased reserves. Import payments reduced reserves. Therefore overall reserves changed if there was a balance of payments (BOP) imbalance. With a **floating exchange rate** a BOP surplus or deficit will lead to a change in the exchange rate and reserves (and therefore the money supply) will not change.

What is the equation of exchange? Explain how it can help us understand the relationship between changes in the money supply and changes in the price level.

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Explain the ways there could be a primary expansion in the money supply.

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Distinguish between a primary and a secondary expansion of the money supply.

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Primary changes in the monetary supply	
Decreases with:	Increases with:
Taxes paid	Increased government spending
Public buying stock	Maturing government stock
OMO (sell)	OMO (buy)

**Secondary expansion (credit creation)** of the money supply results from banks holding excess reserves, more reserves than prudence requires. Banks will increase the amount of credit by allowing customers to go into overdraft on their cheque accounts. Because cheque accounts form a high proportion of M1, a secondary expansion will increase the money supply. Prudence restricts the amount by which a bank can lend out new reserves. It will ensure that sufficient cash is available to meet claims by depositors. The fraction of deposits needing to be retained in reserve was

given **reserve ratio** requirements status, but since 1985, it has been determined by banking prudence. Reserves are normally held as settlement cash deposits at the RBNZ. Reserves form the monetary base.

### Credit Creation Model

If we assume all banks are combined, only cheques are used for transactions and a reserve ratio of 20%, the credit creation model consists of the following stages:

1. A primary expansion of \$1000 is received by bank A
2. New loans of \$800 are made. Borrowers write cheques of \$800 that are deposited in bank B
3. RBNZ adjusts bank A's reserves down \$800 and bank B up by \$800. Bank B makes new loans of \$640, which are deposited in bank C.
4. The process continues, but loans decrease in size each round.

Balance sheet of bank A			
Assets	\$m	Liabilities	\$m
Prudential reserves	200	Deposits	1 000
Loans (advances)	800		
<b>Total Assets</b>	<b>1 000</b>	<b>Total Deposits</b>	<b>1 000</b>

Balance sheet of bank B			
Assets	\$m	Liabilities	\$m
Prudential reserves	160	Deposits	800
Loans (advances)	640		
<b>Total Assets</b>	<b>800</b>	<b>Total Deposits</b>	<b>800</b>

Registered Banks Balance Sheet (all banks combined)			
Assets	\$m	Liabilities	\$m
Prudential reserves	1 000	Deposits	5 000
Loans (advances)	4 000		
<b>Total Assets</b>	<b>5 000</b>	<b>Total Deposits</b>	<b>5 000</b>

The credit multiplier (CM) is

$$\Delta M = \frac{1}{R} \times \Delta N$$

where:  $\Delta M$  = increase in the money supply  
 $\Delta N$  = increase in new money (reserves)  
 $R$  = prudential reserve ratio.

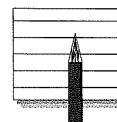
For this example  $\Delta N = \$1000$  and  $R = 20\%$   
 $\Delta M = 1000 / 0.2 = \$5000$

**NB** Credit has increased by a factor of 4 not 5 (\$5000 less the initial increase of \$1000). The multiplier can also work in reverse.

In practice, leakages will occur to reduce the size of the reserves, and thus reduce the size of the CM. These leakages occur because some of the loans:

- are held in the form of cash, and are not deposited in the banks
- go in tax (T)
- go towards paying for imports
- are deposited with other financial institutions, or the government
- will not be made because of the difficulty in finding creditworthy borrowers.

Also the banks may not expand credit to the full value of the CM because they may not find sufficient customers to lend to and they may choose to lend out less to maintain liquidity at certain times.



In simple terms explain how the banking system is able to create credit and thus increase the money supply.

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This information describes conditions in the banking system in the country:  
 total reserves = \$1000m  
 transaction account balances = \$5000m  
 notes and coins held by the public = \$1000m.

(a) How large is the money supply, M1?

(b) Complete the balance sheet below:

Consolidated Balance Sheet of all Banks			
Liabilities	\$m	Assets	\$m
Deposits	_____	Prudential reserves	_____
		Loans	_____
<b>Total deposits</b>	<b>_____</b>	<b>Total Assets</b>	<b>_____</b>

(c) What is the current prudential reserve ratio? (Show your working).

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(d) If bankers consider future conditions to be more favourable they will lower the prudential reserve ratio. Explain the impact of this move on the money supply.

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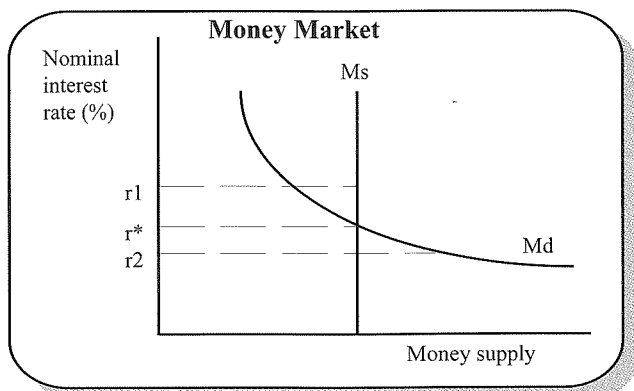
## The Market for Money

**Demand for money.** The demand for money is made up of two elements.

1. The **transactions demand** for money is derived from the level of national income and aggregate demand. Factors that will lead to an increase in aggregate demand in the economy will increase the demand for money.
2. The **asset demand** for money is made up of a combination of the speculative and precautionary motives. Why do people want to hold their wealth in the form of cash (which is non-interest bearing) instead of having it "invested" in a deposit where a good rate of return could be gained? Firstly, people needed cash to be able take advantage of speculative opportunities when it was possible to buy an asset at a cheap price and sell it later at a higher price. Secondly, the precautionary motive is where people have cash available to cope with unforeseen events. The assets demand for money is influenced by the interest rate. An increase in interest rate will decrease the demand for money as the opportunity cost of holding wealth in the form of non-interest bearing cash deposits increases. These factors lead to a downward-sloping demand curve for money (MD).

**Supply of money.** On the other hand the supply curve for money is fixed at a particular point in time because it is controlled by the RBNZ. It is independent of the level of interest and money supply curve is therefore shown as a vertical straight line (MS).

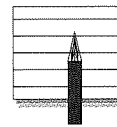
The price of money is the base interest rate ( $r$ ) and is determined by the intersection of  $M_d$  and  $M_s$ . If  $r$  increases consumers are less willing to borrow to finance their purchases.



At  $r_1$   $Q_S > Q_D$ . There will be a surplus of funds, with banks prepared to drop their interest rates to encourage more borrowing. At  $r_2$   $Q_D > Q_S$ , resulting in a shortage of loanable funds, with borrowers now prepared to pay a higher interest rate to secure their funds. At  $r^*$   $Q_S = Q_D$ .

## Functions of the Reserve Bank

1. Issues currency. RBNZ maintains the note and coin issue.
2. Government's banker. RBNZ is banker to government by providing the core public accounts, although the day-to-day banking needs are provided by WestpacTrust Bank.
3. Central Bank. RBNZ is also banker to registered banks, providing the settlement cash deposits which are the core of the monetary base.
4. Supervises banking system. The RBNZ has the responsibility of supervising the banking sector, ensures prudential guidelines are maintained and is able to approve new banks.



Distinguish between the asset and transaction demands for money and state one factor that would lead to an increase in each.

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What is the shape of the demand curve for money?

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Explain the reason for the vertical money supply curve.

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In simple terms, how is the interest rate determined?

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Identify the roles of the RBNZ.

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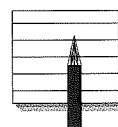
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5. Monetary policy. The RBNZ also has a much wider role in the economy with the responsibility for maintaining price stability through monetary policy. It advises government on monetary policy, credit and exchange rates.



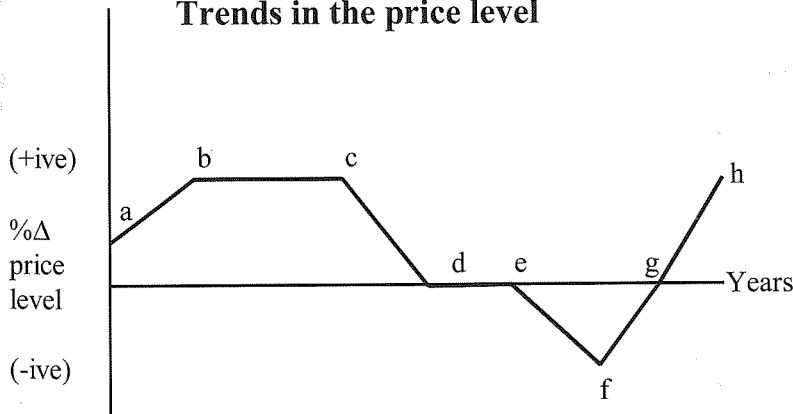
Define monetary policy.

### Monetary Policy

**Monetary policy** is defined as the action taken by the RBNZ to alter the interest rates, the money supply, and the availability of credit to influence the level of economic activity in order to achieve price stability. The framework underlying monetary policy is contained in **The Reserve Bank Act 1989** that established price stability as the sole objective of monetary policy in New Zealand and the Governor of the Reserve Bank was made responsible for achieving this target. Compared to the inflationary years of the 1980s, monetary policy is now narrowly focused on achieving price stability which is defined in the **Policy Target Agreement (PTA)** with the government as zero to 3% inflation (ie. not less than 0% and not higher than 3%). This has more recently been linked to sustainable economic growth, employment and development. The Reserve Bank of New Zealand has to provide six-monthly monetary policy statements (MPS) reviewing monetary policy settings and it provides briefings for the financial sector each fortnight.

**Inflation** is defined as a time when the general price level is rising. This is seen on the graph below as periods ab, bc, gh. If the rate of inflation falls from 10% to 5% the price level is still rising but at a decreasing rate. This is known as **disinflation** and can be seen in the period cd on the graph below. Where the price level actually falls, this is known as **deflation**, and can be seen in the period ef.

**Trends in the price level**



Inflation is traditionally measured quarterly by Statistics NZ using the percentage change in CPI, and this can be termed **headline inflation**. But for the PTA the RBNZ relies on the CPIX, which is CPI less changes in interest rates. The RBNZ can also use a variety of other indicators to forecast future movements in the price level, including: inflationary expectations, cyclical measures of employment, commercial demand, profit margins, import and export price indices, etc.

The RBNZ uses a number of **monetary policy instruments** to achieve price stability:

1. The official cash rate (OCR). The OCR is the interest rate set by the RBNZ. The RBNZ will pay 0.25% less than the OCR to the registered banks for their settlement cash deposits and is prepared to lend to registered banks at 0.25% above the OCR.

What is price stability as defined by the Policy Target Agreement?

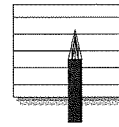
Which law provides the framework for monetary policy in New Zealand?

Identify the trends in the price level for the whole period shown in the graph.

Distinguish between headline inflation and CPIX.

Which measure of inflation is used by the RBNZ to define price stability?

- Open market operations (OMO). OMO refers to the buying and selling of government stock by the Reserve Bank in order to influence the amount of money in circulation. It may be necessary for the RBNZ to adjust the supply of money to ensure the money market is in equilibrium at the OCR. In order to reduce the money supply the RBNZ will sell government stock, which will in effect take money out of circulation, shifting the supply curve to the left.
- Moral suasion (also referred to as "open mouth operations") is when the RBNZ tells the money markets what it would like the money markets to do. Six-monthly monetary policy statements are issued, which detail the RBNZ's interpretation of economic conditions, inflationary pressures and sets out the desired monetary conditions.



List the monetary policy instruments used by the RBNZ to achieve price stability.

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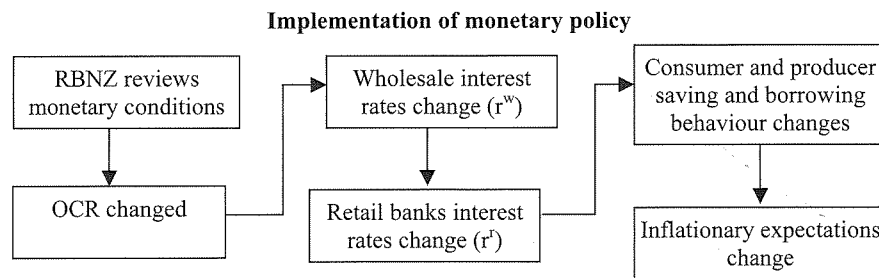
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### Monetary Policy Settings

**Tight monetary policy.** If there are inflationary pressures the RBNZ will tighten monetary conditions by increasing the OCR. This will increase short-term interest rates, so reducing the level of investment, consumer spending, and increasing savings. As a result the level of aggregate demand will decrease and reduce inflationary pressures.

**Loose monetary policy.** If there is a lot of slack in the economy, the RBNZ can afford to loosen monetary conditions. The RBNZ will decrease the OCR, which will lead to a fall in the short term interest rates, which will increase the level of borrowing for consumption and investment spending which will in turn increase the level of aggregate demand.

The linkages that enable RBNZ action to influence inflationary expectations are set out below:



Distinguish between tight and loose monetary policy.

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Explain how each of the monetary policy tools would be used to tighten monetary policy.

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Describe the linkages involved in implementing a tighter monetary policy (refer to the diagrams).

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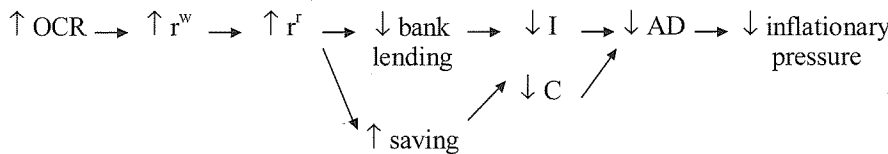


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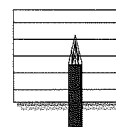
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### Tight monetary policy



### Shifts in Ms and Md

Government could bring about an increase in  $r$  to reduce demand in the economy by reducing money supply. If real incomes rise, this will shift the demand for money to the right from  $M_d$  to  $M_d'$  (see next page).



Describe the factors that are likely to have brought about the changes in the money market shown on the graph (to the left).

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Define the business cycle (refer to Ch C1).

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State the most likely monetary policy settings (tight or loose) used for each of the following points on the left-hand graph:

(C) \_\_\_\_\_

(D) \_\_\_\_\_

(E) \_\_\_\_\_

Explain how price stability can be used to smooth economic cycles.

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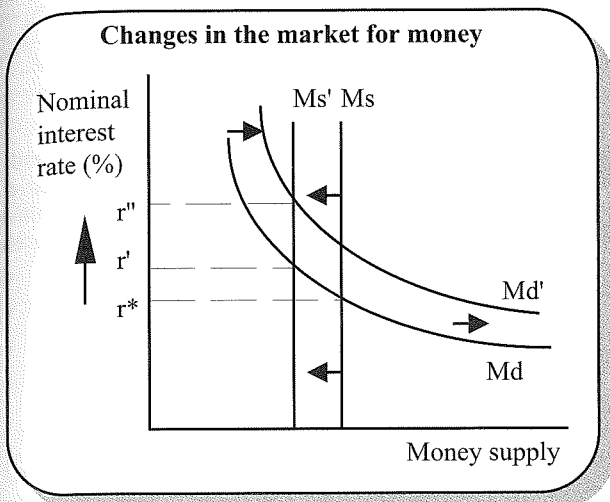
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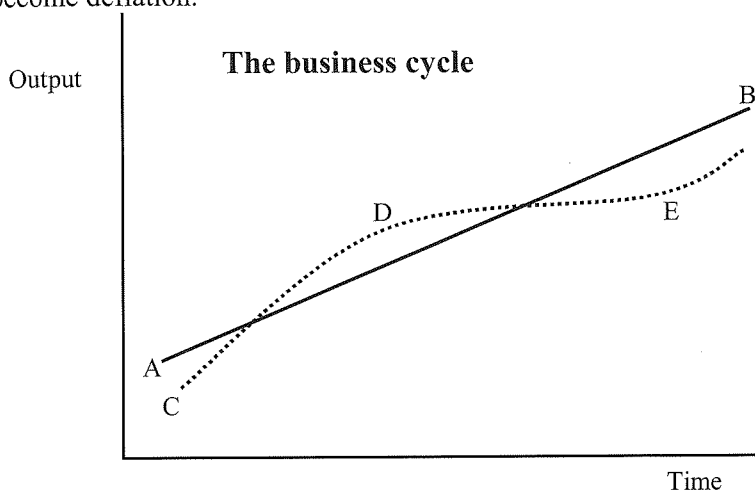
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Changes in the market for money



### Monetary Policy and the Business Cycle

The rate of inflation tends to increase when the overall demand for goods and services exceeds the economy's capacity to sustainably supply goods and services. Likewise, when capacity to produce is greater than demand, then the rate of inflation tends to fall and, if left too long, can even become deflation.



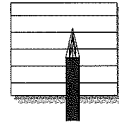
The straight line AB represents the economy's capacity to sustainably supply goods and services. The dotted line CDE line is the economy's actual output, or in other words, demand.

When the dotted line is above the straight line, as at D, this results in shortages, and the rate of inflation then tends to rise. When the dotted line is below the straight line, there is spare productive capacity within the economy and then inflation tends to fall. Because the Reserve Bank is required to keep inflation between 0 and 3 %, it will to adjust demand closer to the economy's long-term capacity to supply. This is carried out by adjusting the OCR and this in turn influences other interest rates and the exchange rate. When interest rates and the exchange rate go up that reduces demand, and when they fall demand increases.

RBNZ will tighten monetary policy at D. When the OCR is increased, interest rates rise, and as a consequence saving is encouraged and bank lending discouraged. Investment and consumption spending will both fall, reducing aggregate demand and inflationary pressures.

Likewise when the economy is in a downturn and perhaps heading into recession at E, there is a risk that the bottom of the 0-3 % target range could be breached, and for the price level to fall, in other words to the changing from inflation to deflation. In this situation monetary policy settings will be loosened, enabling an increase in economic activity, which will stop the economy going into recession

One of the major problems facing the monetary authorities in setting monetary conditions is the time lag. The Reserve Bank estimates that there is a period of roughly 18 months between a change in monetary policy and a resulting change in the pressures on the price level in the economy. As a result, the Reserve Bank must always focus on 18 months into the future in order to comfortably set monetary conditions and achieve price stability.



Write an economics passage to identify and explain the difficulties in running an effective system of monetary policy in order to achieve price stability. Include a diagram in your answer.

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