ENGLISH FOR CIVIL ENGINEERS
ANH VĂN CHUYÊN NGÀNH XÂY DỰNG

KHOA XÂY DỰNG
P202B, 25/K7 Quang Trung
T: 0511-3 827 111 (ext 202)
E: khoaxaydung@duytan.edu.vn

Dương Minh Châu
Chaudmce@gmail.com
Duongminhchau@dtu.edu.vn
0912323573

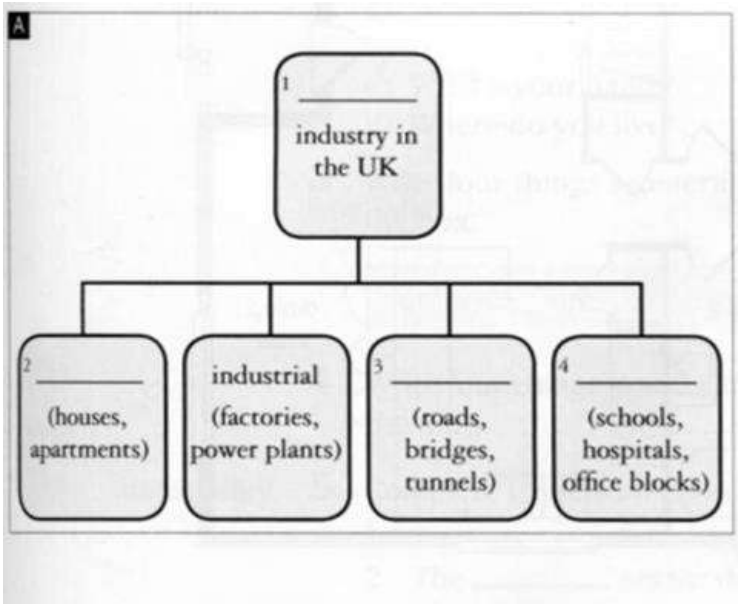
Unit 1 The construction industry

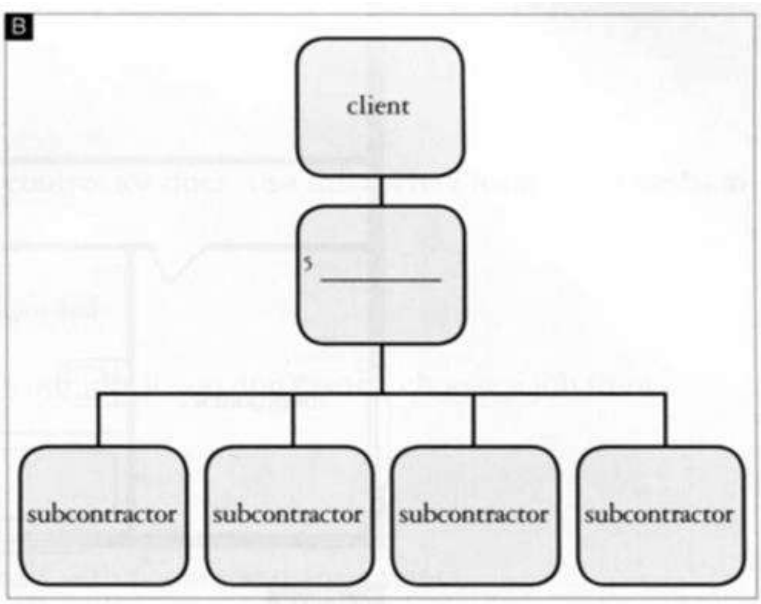
1.1 Construction industry in the UK

1.1.1 Read this text and complete charts A and B

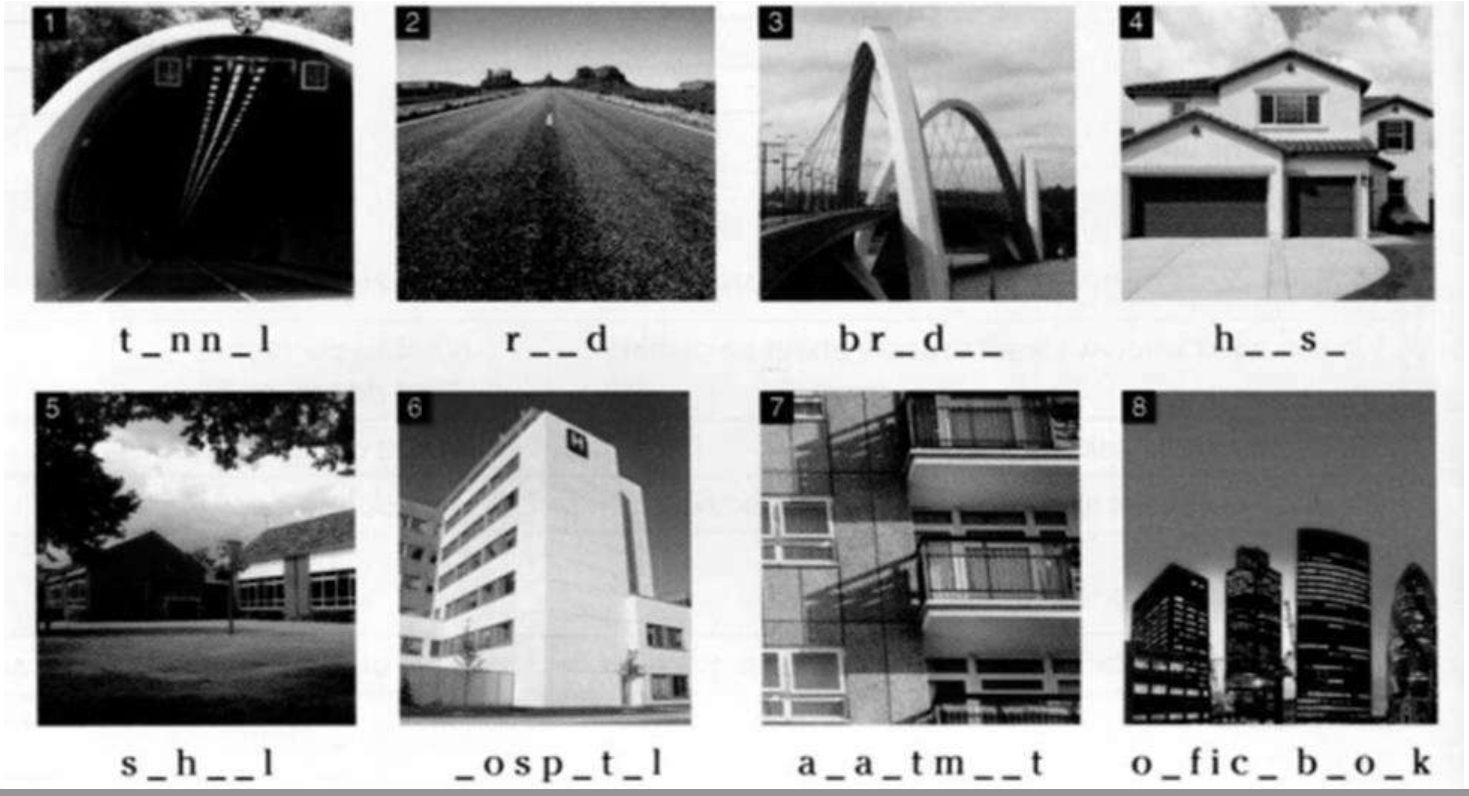
The construction industry in the UK consists of four different sectors. The **residential** sector deals with houses and apartments. The **industrial** sector deals with big projects like factories and power plants. The **infrastructure** sector is for projects like roads, bridges and tunnels. The **commercial** sector is for things like schools, hospitals and office blocks. The **client** pays for the project and hires general **contractors** to deal with **subcontractors**, equipment and materials.

1.1 Construction industry in the UK





1.1 Construction industry in the UK



1.1 Construction industry in the UK

Complete these sentences with the verbs in the box

are consists of deal with hires pays for

a. The general contractor _____ subcontractors.

b. General contractors_____ subcontractors, equipment and materials.

c. The team_____ a site manager, three roofers and a plumber.

d. Roads, bridges and tunnels _____ infrastructure sector projects.

e. The client _____ the project.

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Unit 1 The construction industry

1.2 Writing

1.2.1 Write four things a general contractor does. Use the correct form of the verbs in the box.

deal with hire organize visit

1.2.2 Complete these sentences.

a. The…….. industry consists of four sectors.

b. The…….. sector deals with houses and apartments.

c. The…….. sector deals with roads, bridges and tunnels.

d. The…….. sector deals with schools, hospitals and office blocks.

e. The…….. sector deals with factories and power plants.

1.2 Writing

1.2.3 Complete this text with the words and phrases in the box.

about a project **a new office block** **architect**
residential area **subcontractor** **supplier**

Today I have three meetings. First, I have a meeting (1)……with a client and a(n) (2)……in Bulaq. The project is an apartment block in a(n) (3)……I have a lot of experience with apartment blocks, but not in this part of Cairo. After lunch, I have a meeting with a new (4)…….on a construction site in Al Nasr Road. This meeting is about labourers and equipment for (5)…….. In the evening, I have a meeting with a(n) (6)……to discuss materials for a construction site in Tura. It's a busy day as always!

1.3 Listening

Listen and write the types of construction you hear.

1_____ 2_____ 3_____
4_____ 5_____ 6_____

1.4 Speaking

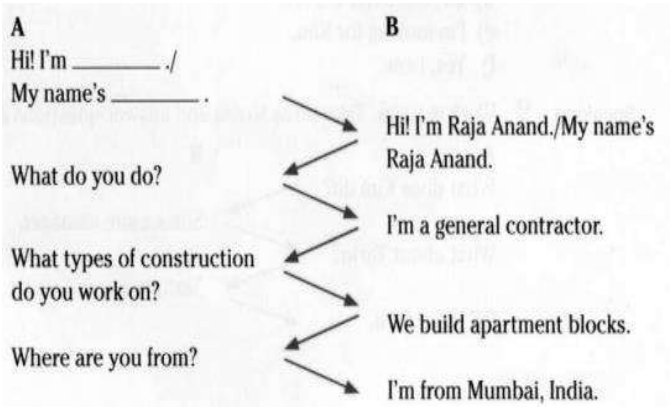
Choose a role card. Introduce yourself to other students. Use the model below to help you.

1 Name: Kasia Katolsky
Job: building inspector
Typical projects: factories, schools
From: Katowice, Poland

2 Name: Thomas Smith
Job: roofer
Typical projects: residential projects (houses, apartments)
From: Toronto, Canada

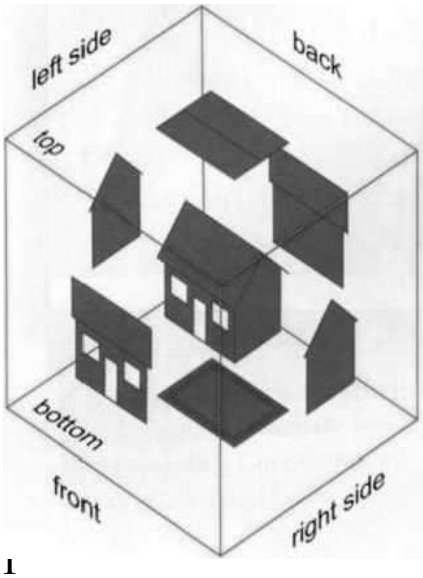
3 Name: Mohamed bin Ali
Job: site manager
Typical projects: hospitals
From: Dubai, United Arab Emirates (UAE)

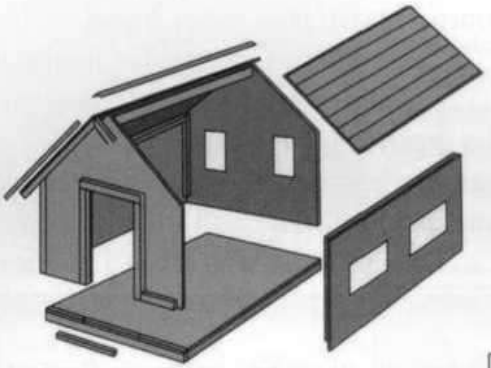
4 Name: Park Ji-Wung
Job: crane operator
Typical projects: bridges, flyovers
From: Seoul, Korea

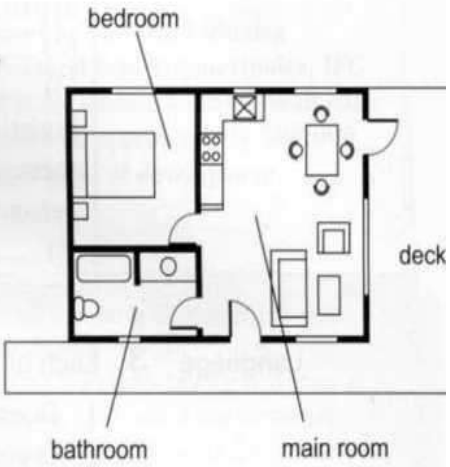


2.1 Types of drawing

2.1.1 Look at three representations of a house. Name the types of drawing. Then read the text and check your answers.







1_____ 2_____ 3_____

2.1 Types of drawing

There are many ways of putting a 3D object into 2D. **Orthographic** projections can be found on all construction projects. These drawings show different views of the object, and can include **elevations** (a view from one side) and **cross-sections** (the view when you cut through an object). Another type of drawing shows **exploded** views, which are very useful for understanding the assembly of an object, in other words how it all fits together. A third type of drawing is the **plan view**, which allows us to see an object from above. A typical example of this is a floor plan. These are very useful when we want to look at the fittings in detail, in other words where objects like cookers and baths go.

2.1 Types of drawing

1.2.3 ***Prints*** ***Read the email from an architect to a contractor. Then, choose the correct answers***

I wanted to update you on my progress on the prints for the Gibson building.

I completed the **orthographic projection** of the building's exterior. This includes a **plan view** of the roof and **elevations** of all sides. I also completed **section** views of several interior walls. This will let you easily see where plumbing and other fixtures should be installed. The prints of the building's interior sections are not yet finished. I have completed **isometric drawings** of several rooms. These prints produce three dimensional images because lines are drawn at thirty degree angles instead of **horizontally**. Unfortunately I am having trouble drawing some of the **irregular** wall features, such as moldings. The best way to show these is in **oblique drawings**. They have the most **complex** surface flat against the paper.

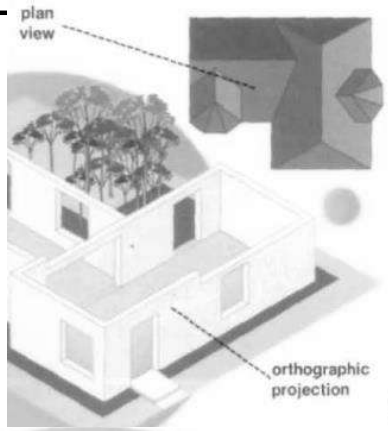
This is a time-consuming process, but I am working as quickly as I can. For additional detail, I am also including some **cross sections** of these surfaces. For your reference, these will be **vertically** oriented.

I attached a rough **sketch** of the building layout. Please look it over and let me know if you have any questions or concerns.

Thanks!

2.1 Types of drawing

1.2.3 ***Prints***

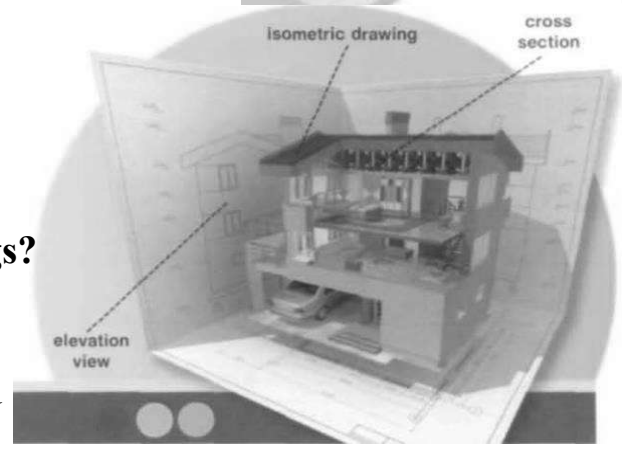


1. What is the purpose of the email?

A. to correct an error in the building prints
B. to list what types of prints need to be created
C. to explain why orthographic projections are not needed
D. to inform the contractor of what prints are complete and incomplete

2. Which of the drawings are NOT finished?

A. plan views
C. oblique drawings
B. section views
D. building layout sketch



3. Why is the architect struggling with some drawings?

A. Several surfaces have been redesigned
B. Some wall features have complex surfaces
C. He has to show where plumbing fixtures are installed
D. He does not have accurate elevation measurements

2.1 Types of drawing

1.2.3 ***Prints***

2.1.2.2 Match the words (1-6) with the definitions (A-F)

1. cross section **2. isometric drawing** **3. orthographic projection**

4. irregular **5. plan view** **6. Complex**

A. a type of drawing that separates each side of an object and shows it flat as if projected against the side of a glass box.

B. a construction drawing with objects shown in three dimensions by drawing horizontal lines at a 30 degree angle.

C. made up of many parts or very detailed

D. the point where a two-dimensional plane intersects with a three-dimensional object as shown in a section drawing.

E. a construction drawing shown from above

F. not having many straight, geometric lines

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Unit 2 Technical drawing

2.1 Types of drawing

1.2.3 Prints

2.1.2.3 Fill in the blanks with the correct words and phrases

section **oblique drawing** **vertically**

elevation **horizontally** **sketch**

1. A floor plan is really a(an)_____view with the roof cut off
2. Mark the elevation _____ on this drawing
3. Please draw a rough_____ of the building plan
4. A(n)_____is useful to show an object with an irregular side
5. Draw that line _____ from left to right.
6. This drawing shows the _____ of the building from ground to roof.

2.1 Types of drawing

1.2.3 Prints

2.1.2.4 Listen to a conversation between a contractor and an architect. Mark the following statements as true (T) or false (F).

1. The woman calls to make an appointment to review the prints_____
2. The measurements in two drawings do not match_____
3. The man cannot complete the woman's request_____

ĐẠI HỌC DUY TÂN
Unit 2 Technical drawing

2.1 Types of drawing

1.2.3 Prints

2.1.2.5 Listen and complete the conversation

Contractor: Hi Paul, this is Joyce Breyer. I was just (1)_____ _____ the prints that you sent over yesterday.
Architect: Great. How do they look?
Contractor: Generally they look great. There's (2)_____ _____ _____
Architect: Oh. Really? What's that?
Contractor: Well, in the plan view you labeled the front office as measuring ten meters by twelve meters.
Architect: Right. I remember that.
Contractor: But here's the problem in the (3)_____ _____It's ten meters by fifteen meters.
Architect: Oh my, I'm glad you (4)_____ _____.
Contractor: I think it's (5)_____ _____ _____ten by twelve.
Architect: I think you're right. I'll double check (6)_____ _____ to be sure
Contractor: Okay Can you get me a copy of the corrected print today?

2.2 Drawing and line

2.2.1 Read the textbook entry on construction drawings. Then, choose the correct answers

Every construction worker must know how to read a **scale drawing**. These illustrations show the layout for a construction project in an accurate **scale**. Construction drawings are made using an **architect's scale**, which often has two scales on one face. You may not be required to use this instrument. However, you should recognize the multiple types of lines that drafters make on drawings. The most basic line is the **object lined**. It is a heavy, solid line that shows the shape of an object.

If the side of an object would not normally be seen, a dashed line called a hidden line, represents it.

Extension lines and **dimension lines** are thin, solid lines. They show the size of an object, such as it's length or width. A short extension line extends out from each side of the object. A dimension line connects the two extension lines, with the measurement written above it.

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Unit 2 Technical drawing

2.2 Drawing and line

You will see a few other lines on drawings. A **centerline** with long and short dashes shows the center axis of an object. A thin line with an arrow called a **leader** labels objects and dimensions in tight spaces. A **cutting-plane line** shows where an imaginary cut was made to obtain a section-view drawing.

1. What should every construction worker be able to do?

A. make scale drawings
B. use an architect's scale
C. identify drafting line mistakes
D. recognize different kind of drafting lines

2. What does a hidden line show?

A. the shape of an object
B. the size of an object
C. the middle point of objects
D. the unseen side of an object

3. Which of the following is NOT a solid line?

A. extension line
C. object line
B. centerline
D. dimension line

2.2 Drawing and line

Match the words (1-5) with the definitions (A-E).

1. dimension line; 2. object line; 3. cutting-plane line; 4. hidden line; 5. leader

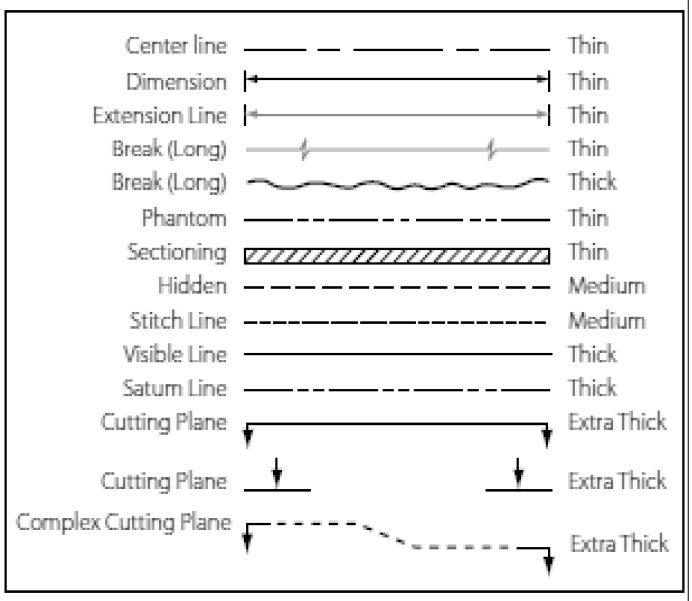
A. a line in a drawing that indicates where a section view is taken from and in what direction it is viewed

B. a line in a drawing that connects an object with its label

C. a line in a drawing that shows edges that are hidden from normal view

D. a line in a drawing that shows the size, such as length or width, of an object

E. a solid line in a drawing that shows the shape of an object



ĐẠI HỌC DUY TÂN
Unit 2 Technical drawing

2.2 Drawing and line

2.2.3 Fill in the blanks with the correct words and phrases

scale; extension line; centerline; architect's scale; scale drawing

1. Use the _____ to complete the drawing.
2. A(n)_____shows the middle of an object.
3. The print has a(n) _____of 100 to 1.
4. The architect is still creating the_____.
5. This_____connects to the dimension line to make the drawing clearer.

2.2.4 Listen to a conversation between a student and an instructor. Mark the following statements as true (T) or false (F).

1. The man is confused about two types of lines._____
2. A cutting-plane line shows a center axis.____
3. Cutting-plane lines are always solid._____

2.2 Drawing and line

2.2.5 Listen again and complete the conversation

Student: I'm having trouble understanding the (1)_____ _____some types of drafting lines.
Instructor: They can be tricky to (2)_____ _____Which ones are confusing you?
Student: A centerline and a (3)_____ _____ _____Don't they both show the center of something?
Instructor: Not necessarily. You're right that a centerline shows the (4)_____ _____ of something?
Student: Okay. But doesn't a cutting-plane line show (5)_____ _____ _____?
Instructor: No, It shows where the cut for a (6)_____ _____ _____is. That doesn't have to be in the middle of the object.
Student: Oh. I see. It doesn't have to divide the object in half.
Instructor: That's right. You can also tell them apart by how they look.
Student: A cutting-plane line is usually solid, right?
Instructor: It can be either solid or dashed. And a centerline has long and short dashes.

DAI HOC DUY TAN
Unit 2 Technical drawing

2.3 Floor plan

2.3.1 Read the government website about building permits.

What is a floor plan?

A floor plan is a detailed **diagram** of your proposed building layout. It describes the type of building as well as all major features. It is typically shown from a **bird's-eye view**. Every building project must submit a floor plan.

What must be included in a floor plan?

Every floor plan must specify the dimensions of the building and all interior rooms. The function of room should be labeled. The **placement** of all fixture such as for plumbing and lighting, must be marked. Spaces for large **appliances** such as refrigerators typically labeled as well. However, these labels are not required. Last, **indicate** nearby streets and utility access.

When do I submit a floor plan?

Submit a copy of your floor plan when your architect finalizes the design. The floor plan must be approved before you can begin excavation.

2.3 Floor plan

2.3.1 Choose the correct answers

1. What is the purpose of the website?

A. to demonstrate the layout of a floor plan B. to explain requirements for floor plans

C. to help contractors submit floor plans D. to describe the floor plan approval process

2. Which of the following does NOT have to be included in a floor plan?

A. the dimensions of the building B. the placement of fixtures

C. the function of every room D. the labels for appliance spaces

3. When should people submit a floor plan?

A. once they begin excavation B. when the construction is finished

C. when the architect completes the design D. after they have a first draft of the plan

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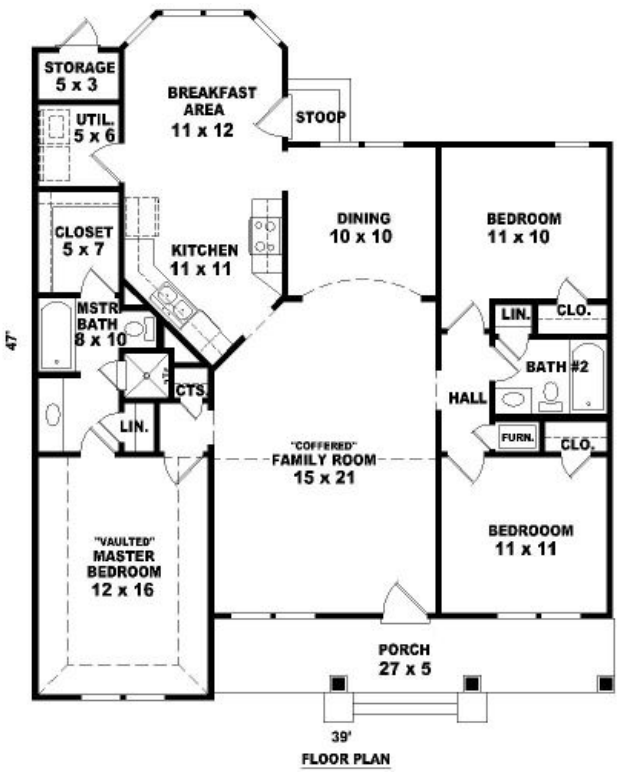
Unit 2 Technical drawing
2.3 Floor plan



2.3 Floor plan

2.3.2 Match the words (1-6) with the definitions (A-F)

1._ fixture **2._interior** **3._ specify**
4._ building layout **5._ indicate** **6._bird's-eye view**

A. the inside part of a building or other structure
B. showing a view from above
C. a diagram drawn to scale showing the detailed features of an entire building
D. a part of a building that is fixed in place and permanent
E. to point something out or make it known.
F. to state or mark something clearly or in detail

2.3.3 Listen to a conversation between an architect and a contractor. Mark the following statements as true (T) or false (F).

1._ The woman calls about an error in the floor plan
2._ The floor plan IS for a new office building.
3._ The floor plan should not include appliance positions

ĐẠI HỌC DUY TÂN
Unit 2 Technical drawing

2.3 Floor plan

2.3.4 Listen and complete the conversation

Contractor: I wanted to talk about the floor plan for the office we're building.

Architect: I received your email earlier. Were just starting to (1)_____ _____the floor plan.

Contractor: That's great. Do you need any more (2)_____?

Architect: (3)_____ _____ _____ _____more about the purpose of the office?

Contractor: It's a pretty standard (4)_____ _____It'll have a large room for desks and some offices along the walls.

Architect: I see (5)_____ _____desks should fit in the large room?

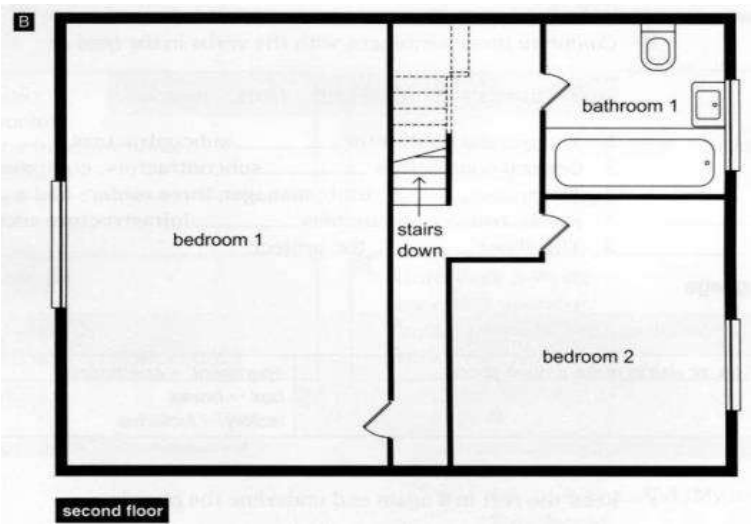
Contractor: The client wants (6)_____ _____for fifteen.

Architect: Okay. Should standard bathroom and break room fixtures be included?

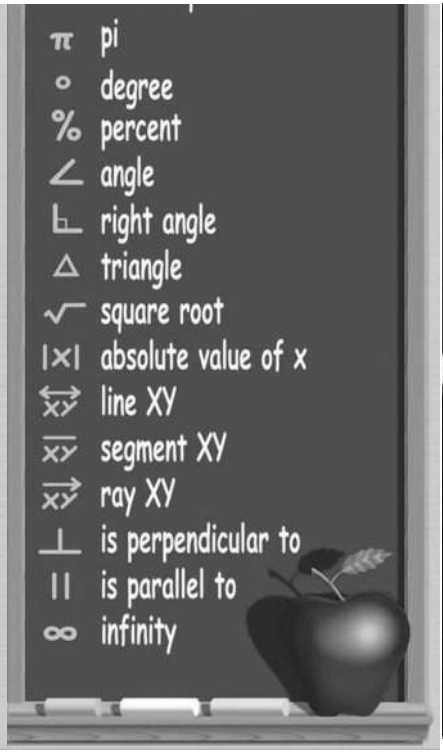
Contractor: Yes. There should be room for a full-size refrigerator in the break room.

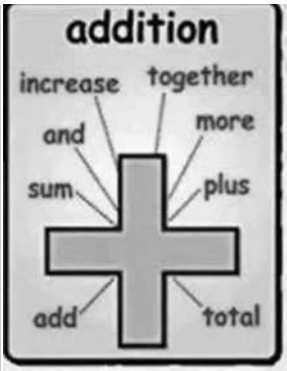
2.3 Floor plan

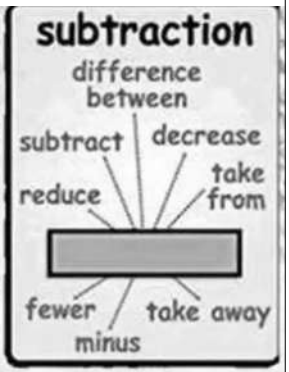
2.3.5 Look at house plans A and B. Then listen. Does the speaker describe the house correctly?

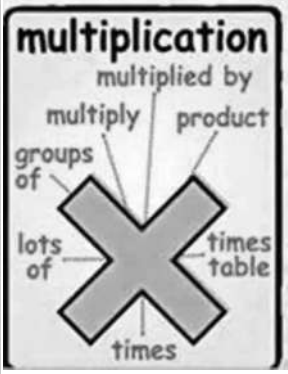


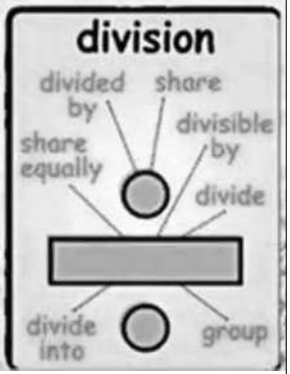
3.1 Basic math



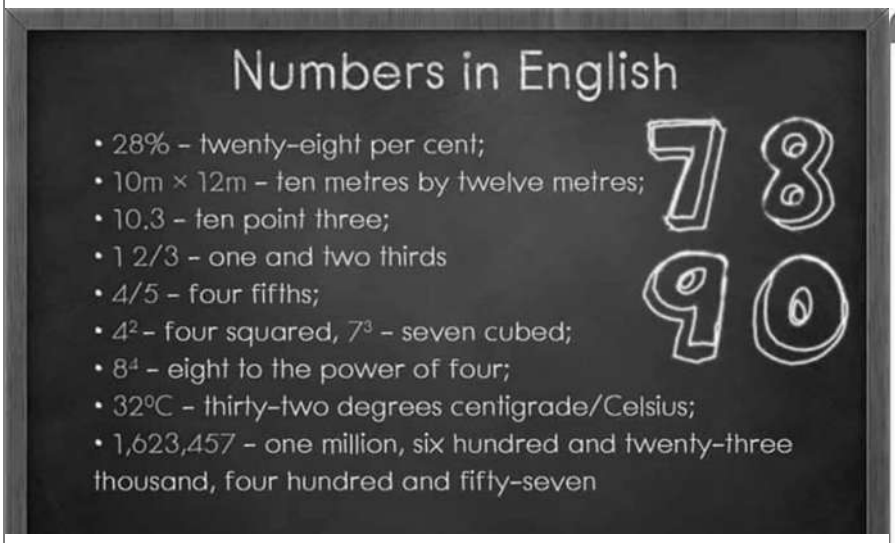


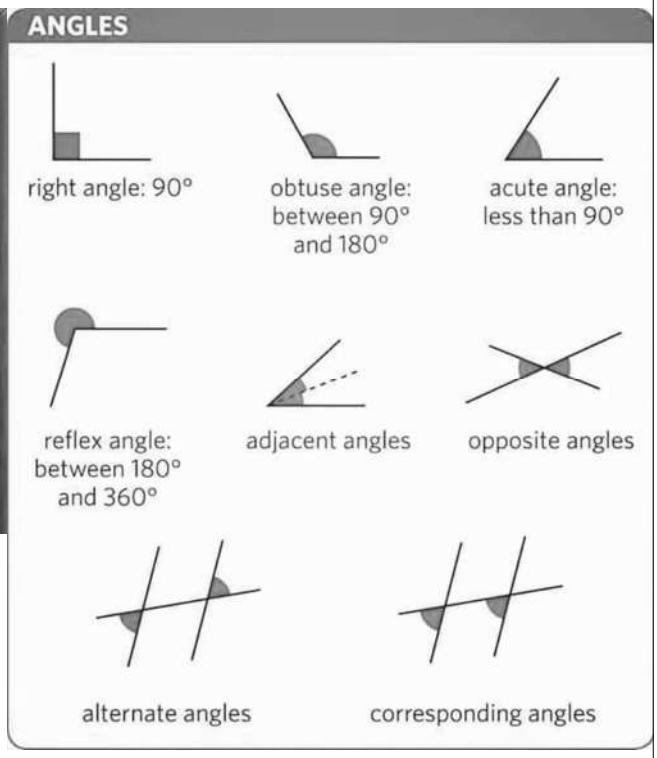






3.1 Basic math





ĐẠI HỌC DUY TÂN Unit 3 Basic math, numbers and shapes

3.1 Basic math

3.1.1 Read the email about the cost of materials. Then, mark the statements as true (T) or false (F).

Charles.

You asked why the order was so expensive.

We need about two and a half bags of concrete for each structure. I **rounded up** to three bags per structure. There are ten structures. When you multiply that, it equals thirty bags. That part of the order was $150. The cost of concrete **plus** the cost of rebar **came** to over $600. When you add shipping costs, it totals $650.

I can **subtract** a few items to save money. The total **minus** the cost of rebar is around $175. Or, we can make several payments. The bill **divided by** three payments is about $215. We could pay the remainder with the last payment Let me know what you prefer.

Barbara.

3.1 Basic math

3.1.1 Read the email about the cost of materials. Then, mark the statements as true (T) or false (F).

1. ___The company is working on thirty structures.
2. ___The cost of rebar was more expensive than the cost of concrete.
3. ___Shipping costs were about $175.

3.1.2 Match the words (1-5) with the definitions (A-E)

1_ subtract 2_ multiply 3_ add 4 _ round up 5 _ divide

A. to increase a number to a greater whole number, often ending in zero.
B. to split a number into equal amounts.
C. to take one number away from another.
D. to combine two or more numbers.
E. to add one number to itself a specific number of times.

ĐẠI HỌC DUY TÂN Unit 3 Basic math, numbers and shapes

3.1 Basic math

3.1.3 Listen to a conversation between a clerk and a construction company manager. Choose the correct answers.

1. What is the conversation mainly about?

A. rounding up a total
B. adding items to an order
C. subtracting shipping costs
D. dividing payments for an order

2. What is true of the total?

A. The woman wants to divide it.
B. The man added to it incorrectly
C. It is lower after subtracting items.
D. It does not include shipping costs

3.1 Basic math

3.1.4 Listen again and complete the conversation

Clerk: Okay, Ms. Hoffman, I'll (1)_____ _____your invoice. What can I do for you?

Manager: I have to (2)_____ _____ _____of my order.

Clerk: Sure. (3)_____ _____ _____beams do you need?

Manager: I want to (4)_____ _____to the original fifteen.

Clerk: So fifteen (5)_____five is twenty. Your new total (6)_____ _____$976.12.

ĐẠI HỌC DUY TÂN Unit 3 Basic math, numbers and shapes

3.2 Decimals, fractions, and percents

3.2.1 Read the guide about converting fractions, decimals, and percents.

1. **Reducing** Fractions: Divide the **numerator** and **denominator** by the same number. Repeat if necessary until both cannot be divided into whole numbers.

2. **Percentages**: A **percent** is a fraction. Its denominator is 100. So 71% is equal to 71/100. In decimal form, this is 0.71.

It is usually easier to do calculations with decimals instead of fractions. Convert measurements that are fractions to decimal form.

3. **Convert** a fraction to a decimal: Divide the numerator by the denominator.

4. Convert a **mixed number** to a decimal: First, write the whole number. Place a decimal point to its right. Change the fraction to a decimal (see above). Then write it to the right of the decimal point.

3.2 Decimals, fractions, and percents

Then, mark the statements as true (T) or false (F).

1_ Divide the numerator and the denominator to reduce a fraction.

2_ The denominator of any percent is 100.

3_ Divide the denominator by the numerator to convert a fraction to a decimal.

3.2.2 Match the words (1-5) with the definitions (A-E)

1_ numerator; 2_ fraction; 3_ percent; 4 _ whole number; 5 _denominator

A. a number that is not divided into parts

B. the lower number of a fraction

C. a ratio of two numbers, expressed with one number written above the other

D. the upper number of a fraction.

E. a number that expresses a part of something per hundred.

ĐẠI HỌC DUY TÂN Unit 3 Basic math, numbers and shapes

3.2 Decimals, fractions, and percents

3.2.3 Fill in the blanks with the correct words and phrases

decimal convert percentage reduce mixed number

1. The expression 12 2/3 is a_____.

2. _____that fraction to its simplest terms.

3. What _____ of the insulation is installed?

4. Please _____ that fraction to a decimal.

5. _____numbers are usually more accurate than fractions.

3.2 Decimals, fractions, and percents

3.2.4 Listen to a conversation between construction worker and a manager

Choose the correct answers

1. What is the conversation mainly about?

A. reducing a fraction B. working with mixed numbers

C. comparing decimals and fractions D. convening a fraction to a decimal

2. How should the man write the result?

A. as a whole number B. as a decimal

C. as a mixed number D. as a percent

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3.2 Decimals, fractions, and percents

3.2.4 3.2.5 Listen again and complete the conversation.

Worker: I (1)_____ _____ _____this. How do you convert a fraction to a decimal?

Manager: Ah. where are you (2)_____ _____?

Worker: Well, you (3)_____ _____ _____by the numerator, right?

Manager: No, you divide (4) _____ _____by the denominator.

Worker: Oh. I see. That makes a lot (5)_____ _____.Thanks for the help.

Manager: You're welcome. I (6) _____ _____with those, too.

3.3 Numbers

Odd numbers	1, 3, 5, 7	
Even numbers	2, 4, 6, 8	
Prime numbers	2, 3, 5, 7	
Common fractions	¼, ½, ¾	one-quarter, one-half, three fourths (quarters)
Decimal fractions	11.8	eleven point eight (decimal fractions are separated by a point and not comma)
Powers	4^2 7^3 8^4	four squared, seven cubed, eight to the fourth power
Roots	$\sqrt{9}$, $\sqrt[3]{27}$	the square root of nine, the cube root of twenty seven
Percentages	28%	twenty-eight per cent
Parameters	30m x20m	thirty meters by twenty meters
Ratio/proportion	2 : 3	two to three
Long integers	2,582,934	two million, five hundred eighty-two thousand, nine hundred thirty four
Temperature	31°C	thirty-one degrees Celsius/Centigrade
Area	80 m^2	eighty square meters
Volume/capacity	53 m^3	fifty-three cubic meters
Velocity	130 km/h	one-hundred and thirty kilometres per hour
Acceleration	10 cm/s^2	ten centimetres per second squared
Density	3.86 kg/m^3	three point eight six kilograms per cubic meter

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3.3 Numbers

3.3.1 Match the numbers in the box with the words below.

50 m x 20 m	3^2	- 5ºC	¼	9^3
42.9%	3,295	2/3	√16	12.62

a. minus five degrees Celsius b. fifty meters by twenty meters

c. twelve point six two d. three squared

e. three thousand two hundred and ninety-five

f. forty-two point nine percent

h. the square root of sixteen

g. two thirds i. one quarter j. nine cubed

3.3 Numbers

3.3.2 Guinness Book of Records

Read the text aloud then match the subjects with their names and parameters

According to the Guinness Book of Records the tallest man in the world is Vimal Singh, who is 2.72 m tall, and the shortest man is Younis Edwan, who is only 0.65 m. The heaviest man in the world is Morgan Reid with a weight of 635 kg, and the heaviest woman is Avinash Persaud, who weighs 725 kg. The oldest person in the world was Jeanne Calment, who died when she was 122 years and 164 days old. The oldest living person in the world is a Japanese woman, who is 114+ (as of February 2010). She was born on 10 May 1895.

As for structures, the tallest structures are dozens of radio and television broadcasting towers that are around 600 m. The three tallest buildings in the world are the 828 m tall Burj Khalifa in Dubai, the United Arab Emirates, the Taipei 101 in Taiwan, which is 509 m tall, and the Petronas Towers in Kuala Lumpur, Malaysia at 452 m.

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3.3 Numbers

3.3.2 Guinness Book of Records

The longest bridge is the Lake Pontchartrain Causeway, which was built in1956 in the USA. It is 38,344 m long, and the longest cross-sea bridge of 32,500 m was built in China in the year 2005. The longest tunnel is the Seikan Tunnel in Japan, which is 53,850 m long, and the tunnel with the longest underwater section is the Channel Tunnel linking England and France since 1994. It is 49,940 m long.

the highest waterfalls	Mount Everest	219,000 m^3/s
the tallest monument	the Amazon	6,695 km
the longest river	Angel Falls	8,848 m
the highest mountain	the Great Pyramid of Giza	138.8 m
the largest average discharge	the Nile	979 m

3.4 Shapes and dimensions

Mathematics and descriptive geometry are an integral part of civil engineering studies. Designers draw shapes and patterns to create a project; other civil engineering specialists calculate the correct proportions of the designed structure.

There are various shapes of lines, two-dimensional (2D) figures and three-dimensional (3D) figures.

Lines: straight, curved, bent, horizontal, vertical, parallel, tapering, perpendicular.

2D figures: square, rectangle, triangle, circle, semi-circle, pentagon, hexagon, octagon, trapezoid, trapezium, rhombus.

3D figures: cube, prism, sphere, hemisphere, pyramid, cone, cylinder.

A rectangle is a two-dimensional figure with two opposite sides that are parallel and the adjacent ones are perpendicular. A rectangle has four right angles. Something with the shape of a rectangle is rectangular, e.g., a long rectangular table. If we want to calculate the perimeter or area of a rectangle, we need to know how long and how wide the sides are. If we have the length and width of the rectangle, we can start calculating.

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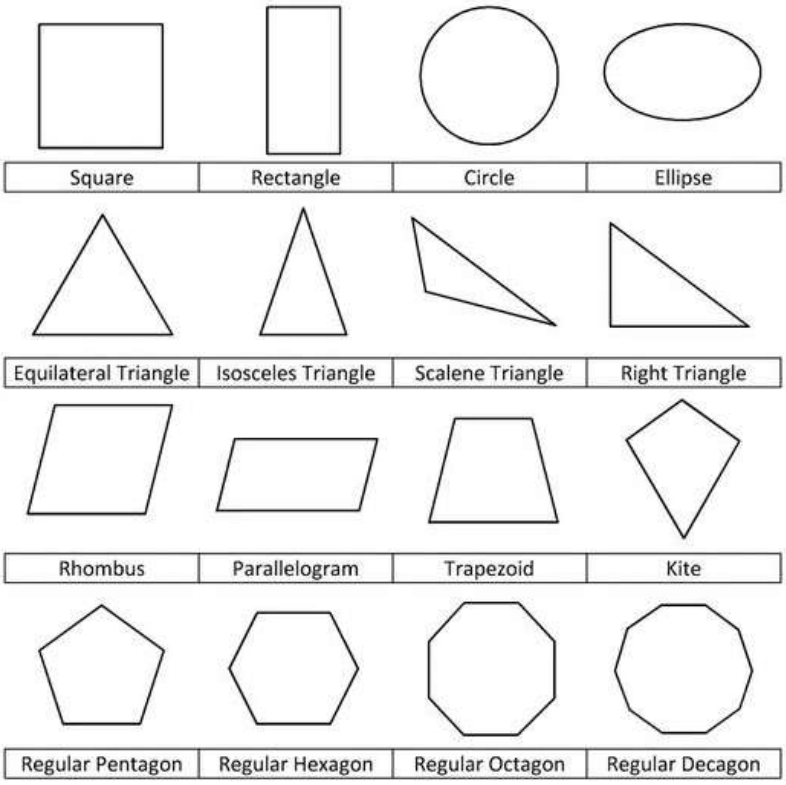
3.4 Shapes and dimensions

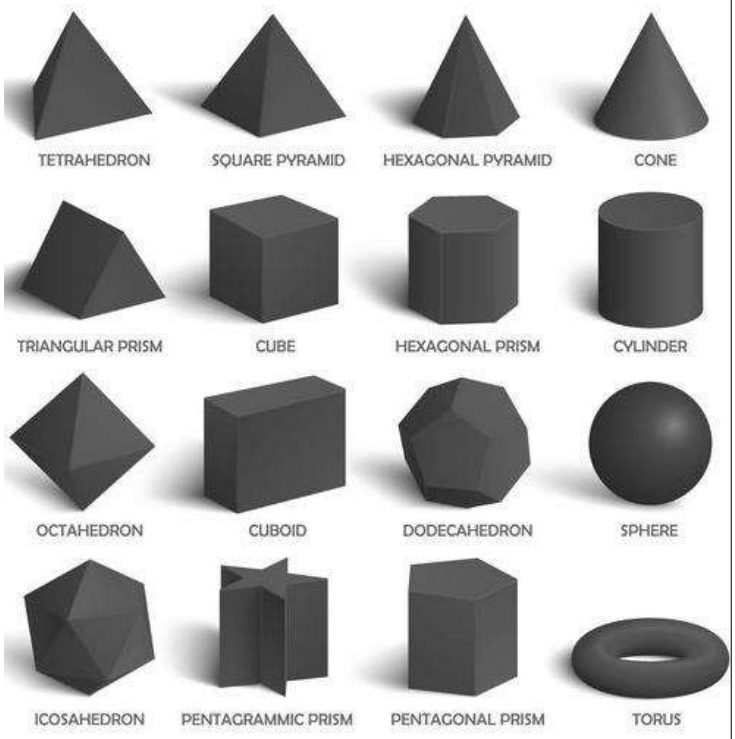
A circle is a round shape consisting of a curved line that completely encloses a space and is the same distance from the centre at every point. Something in the shape of a circle is circular. A circle is cut in half by its diameter. Its two halves can be called semi-circles. The radius of a circle is the distance from its centre to the circumference.

A cube is an object like a box with six square sides that are all the same size. Cubic units are used for measuring volume. A sphere is a round object like a ball. A cube and sphere are both three-dimensional objects.

A cylinder is a three-dimensional object. Its cross-section is circular in shape, and its longitudinal section is rectangular in shape. In other words the cross-section of a cylinder is shaped like a circle, and the longitudinal section is shaped like a rectangle. The cross-section of a cone is also circular in shape, but the longitudinal section is shaped like a triangle.

3.4 Shapes and dimensions





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3.4 Shapes and dimensions

Complete the sentences with the correct words

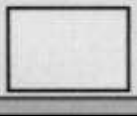
1. A tennis court is shaped like a _____.
2. If we have the length and width of a room, we can calculate its _____ or _____.
3. The Great Wall of China is over 2,000km _____.
4. The first Egyptian _____ is over 140m high.
5. A two-dimensional figure that has three sides and three angles smaller than 90° is a _____.
6. Volcanoes are shaped like a _____.
7. A bar chart is _____, and a pie chart is _____ in shape.
8. The bottom and top of a _____ are circular in shape.
9. A shape with five sides, usually of equal length and angles greater than 90°, is called a _____.
10. The two halves of a circle can be called _____.

3.4 Shapes and dimensions

3.4.2 Listen and write the conversation letter next to the shape.

Listen again and complete the table using the words:

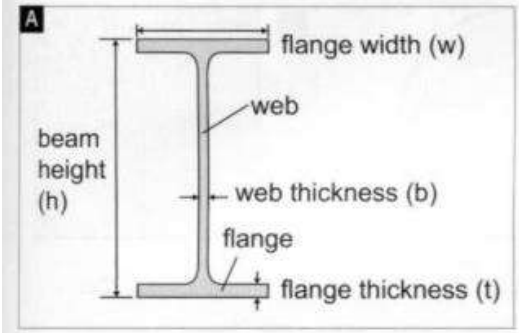
I-Shape
Rectangular
Sphere
Square
Triagular

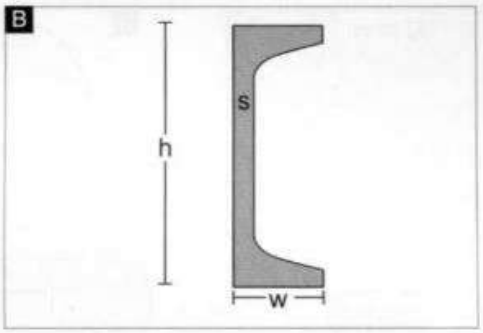
1 _____		a triangle	a(n) [2] _____ truss
3 _____		an I-shape	a(n) [4] _____ girder
5 _____		a circle	a circular rod
6 _____		a square	a(n) [7] _____ beam
8 _____		a cylinder	a cylindrical can
9 _____		a(n) [10] _____	a spherical damper
11 A		a rectangle	a(n) [12] _____ room

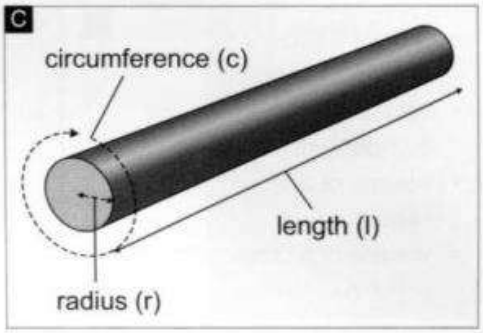
ĐẠI HỌC DUY TÂN Unit 3 Basic math, numbers and shapes

3.4 Shapes and dimensions

3.4.3 Listen to a structural engineer describing the dimensions of two beams: an I-shaped cross-section and a standard channel cross-section, and a rod Complete these tables.







I-shaped cross-section	
Flange width:	(1) _____
Flange thickness:	(2) _____
Web thickness:	(3) _____
Beam height:	(4) _____
Area:	(5) _____

Standard channel cross-section	
Depth (h):	(6) _____
Width (w):	(7) _____
Web thickness (s):	(8) _____
Area:	(9) _____

Rod	
Radius (r):	(10) _____
Length (l):	(11) _____