



Australian Government

A U S T R A L I A N
A P P R E N T I C E S H I P S

Your Life. Your Career. Your Future.

Spatial Information Services & Surveying

Practice Aptitude Quiz

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Part 1: About this quiz

Use this quiz to prepare for an Apprenticeship in Spatial Information Services & Surveying

This quiz:

- Is NOT a formal assessment tool or pre-requisite for any job application
- Shows key learning standards for the Spatial Information Services & Surveying industry
- Has been developed with the help of industry leaders, TAFE and high schools

Quiz details

This quiz will:

- Take approximately 90 minutes to complete
- Ask you numeracy and literacy questions specific to the Spatial Information Services & Surveying industry
- Assess your literacy and numeracy at a Year 12 standard
- Allow you to use a calculator
- Share correct answers at the end

Who should take this quiz?

You should complete this quiz if you:

- Are thinking about starting an Apprenticeship in the Spatial Information Services & Surveying industry
- Want to practise for a formal aptitude test

Need help with your literacy and numeracy skills?

If you want to improve your literacy and numeracy skills, reach out to any of the below:

- Australian Apprenticeship Support Network providers
- Your Registered Training Organisation when you start training
- Reading Writing Hotline:
1300 655 506
www.readingwritinghotline.edu.au
- Careers advisers and your teachers (if you're in high school)

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More information about the Spatial Information Services & Surveying industry

Visit www.yourcareer.gov.au/industries/e/construction

On this page you'll be able to:

- See the most popular Spatial Information Services & Surveying industry occupations
- Get general information and statistics about the industry
- Search for Spatial Information Services & Surveying industry courses

How to use this quiz

This is an interactive form that can be filled out on your computer.

You can either:

- Fill it out on your computer; OR
- Print it out; OR
- Write your answers down on paper as you go.

Use the answers section at the end of the quiz to see how you went.

How to complete this quiz on your computer

1. Download and save the quiz onto your computer
2. Open the file from your computer
3. Fill in the form using a keyboard and mouse

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Part 2: The Quiz

Section 1: Language and Literacy

1. Each sentence has one word which is incorrect. Write the correct spelling of the word:

a. I have seperate instruments for each of you.

b. That is absolutely unbelievable.

c. The accomodation for the survey party was unsuitable so they left.

2. Which of the following correctly completes these sentences? Select the correct response from the list of four options given for each sentence.

a. Joni was positive she was outside when she _____ the siren go off.

was heard

heard

will hear

hears

b. We were concerned when we saw _____ person it was who had been evacuated

when

who

what

which

c. Vuong discovered that the plans could be drawn _____ on a computer

more easy

really easy

more easily

easy

d. The survey team will be leaving their office on Sunday as _____ are spending two days working in Alice Springs. On Wednesday morning, _____ are due back in Adelaide.

their

they

there

they're

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3. Which sentence has the correct punctuation? Select the correct answer.

- a. Tessa asked, 'where are you going Jamie?'
- Tessa asked. 'Where are you going Jamie?'
- Tessa asked 'where are you going Jamie?'
- Tessa asked 'where are you going Jamie'
- b. Last August, was the coldest month ever recorded?
- Last August was the coldest month, ever recorded.
- Last August was the coldest month ever recorded.
- Last August, was the coldest month ever recorded.

4. Which sentence is correct? Select the correct answer.

- a. The papers you gave to me have been filed in the storeroom.
- The papers you give to me have been filed in the storeroom.
- The papers you gaved to me have been files in the storeroom.
- The papers you gived to me have been files in the storeroom.
- b. The really long train moved quickly as it rounded the bends.
- The real long train moved quickly as it rounded the bends.
- The really long train moved quick as it rounded the bends.
- The real long train moved quick as it rounded the bends.

Practice Aptitude Quiz

5. Read the following article about Spatial Information Services and Surveying occupations and answer the questions that follow:

Do you know where your backyard ends and your next-door neighbour's yard begins? Do you know the size of the block of land that your house is on? These are questions that can be answered by Surveyors.

Surveyors primarily determine position on the earth's surface by undertaking measurements and from these measurements produce drawings of what the earth's surface looks like.

Surveying involves several types of workers:

- Cadastral or licensed Surveyors measure land. They describe where a certain area of land is. They explain what it looks like, and how much is there. They are responsible for locating the exact corners of blocks of land when land is being sold or developed for houses. They put these facts in documents such as deeds, leases, and other legal documents;
- Geodetic Surveyors measure large areas of the earth's surface where it is necessary to take the curvature of the earth into account;
- Engineering Surveyors determine where buildings, roads, railways and bridges are to be located. They are responsible for determining what the ground looks like for the area of a project, and are then responsible for positioning the features for the project (buildings, roads etc);
- Mining Surveyors determine the layout of a mine site. They are responsible for where everything on a mine site is positioned, as well as determining where resources such as ore is to be mined. At the end of each month they determine how much of the resource has been removed;
- Marine or Hydrographic Surveyors survey harbours and rivers, and locate and position drilling rigs and undersea communication cables and pipelines.

Surveyors also study legal records. They look for previous property boundaries. They record the results of the survey. They make sure that their spatial data is correct. Afterwards, they draw plans to show what the area looks like and then write reports. Surveyors who set up boundaries must be licensed by the State or Territory in which they work.

Another type of worker is a Survey Technician. Survey Technicians help Surveyors when they go to a site. They might assist the Surveyor with measuring distances and angles, with measuring tapes or electronic distance measuring equipment. Survey Technicians write field notes, as well as make sketches and enter information into computers.

Some survey parties include Survey Assistants. They assist the Surveyor and the Survey Technicians by holding a prism or a staff, driving vehicles, and maintaining the equipment. They also assist by setting up equipment, placing stakes and pegs in the ground, and carrying equipment.

How can you get to a specific location? What does the land in another part of the country look like? How are maps created? These are questions answered by Cartographers, another occupation in the Spatial Information Services and Surveying field.

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Cartographers undertake the tasks of designing, compiling, drafting and reproducing maps. They use information collected from aerial photographs and the data collected by Surveyors to select the information required for the map. Cartographers produce maps for a wide range of purposes, from town planning and mining, to road maps and topographical maps.

Most maps are produced using specialised computer software. Cartographers require good computing skills to master this software.

Specialist Cartographers, called Photogrammetrists, use computer software to interpret the information from aerial photographs so that it can be used on maps.

Most Cartographers are employed by government organisations and large Spatial Information Services companies.

Do you know how much wheat will be produced in this year's harvest? Do you know how far flood waters could possibly extend? These are questions that can be answered by another occupation in the Spatial Information Services field, the Geographical Information Services (GIS) Technician.

Geographical Information Services (GIS) Technicians use imagery from satellites and aerial photography to interpret what is happening on the earth's surface. They analyse, manipulate, retrieve and store spatial data.

GIS Technicians don't necessarily make maps, but rather they use spatial data and specialist software to help people, organisations and governments to make decisions.

About Conditions of Work

Most people employed in the Spatial Information Services and Surveying Industry usually work an 8-hour day, 5 days a week, although Mine Surveyors often work 12-hour days for 8-9 days and then have 5-6 days off.

Surveyors often spend a lot of their time outdoors, sometimes in remote areas. They can work longer hours during the summer when the weather is good and the sun stays up longer, whereas Cartographers and GIS Technicians spend almost all their time in offices working on computers.

Land Surveyors and Technicians often stand for long periods. They have to climb hills and walk long distances. Sometimes they have to stay out overnight. They carry heavy packs of instruments and equipment. They face all types of weather when they are working outdoors.

Surveyors also spend a lot of time in their office, where they will work on a computer. While in the office, they have to download the data that they have collected in the field into a computer so that they can make plans.

They will design the layout of features for projects, and then download the coordinates for these features into their surveying instruments for when they go back out into the field. While in the office they will review what they have collected in the field, and prepare reports and plans. Most of the time, surveyors use computers to do mathematical problems and draw plans.

Practice Aptitude Quiz

6. Risk Minimisation Controls

The following are common controls or ways in which to minimise workplace injury. Match the controls with the hazards. Write your answers in the third column of the table on the following page:

Note: There may be multiple controls for each hazard.

Controls:

- i. Hat
- ii. Sunscreen
- iii. Long sleeved shirt
- iv. Work in groups or pairs
- v. Protective boots
- vi. Manual handling guidelines
- vii. Safety cones
- viii. Reflective vest
- ix. Follow pedestrian road safety

	Hazards	Risk	Risk Minimisation Controls
a.	Road traffic	Injury	
b.	Sun exposure/weather	Sunburn	
c.	Manual handling	Injury	
d.	Crossing roads	Injury	
e.	Drop object	Foot injury	

Practice Aptitude Quiz

Section 2: Numeracy

1. Evaluate the following:

a. $841.59 + 27.50 + 653.23 + 327.99$

b. $453.538 - 374.859$

2. Multiply the following:

a. 453×4

b. 638.3×6

3. Divide the following:

a. $741 \div 3$

b. $407.0 \div 4$

4. Manipulate the following equations to make Y the subject:

a. $D + H - J + T = U - Y + R$

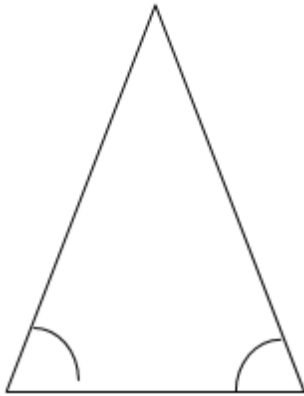
b. $H + (R - 3) = K - Y$

c. $Y(E + 7) = (T - E)$

Practice Aptitude Quiz

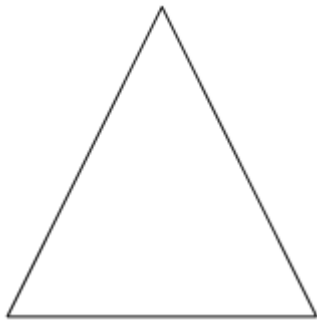
5. What is the name for each of these triangles?

a.



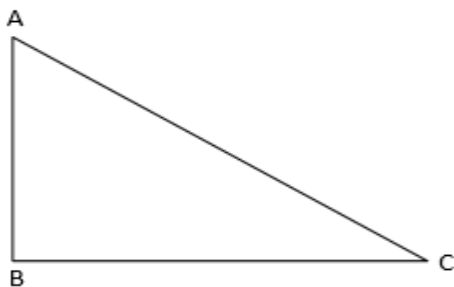
Where the two angles shown are equal:

b.



Where all three sides are equal:

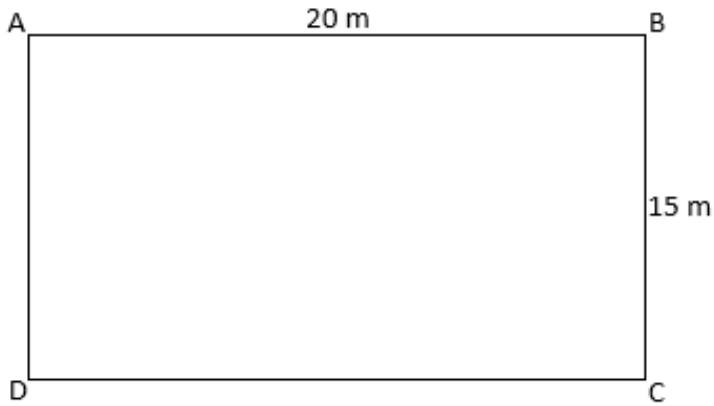
6. A Surveyor working on a building site has to set out a line AB at right angles to the baseline BC. He decides to use Pythagoras' Theorem for this, so he measures side AB = 3 m and side BC = 4 m. What length must side AC be for angle B to be 90°?



AB	=	3 m
BC	=	4 m
Angle B	=	90°

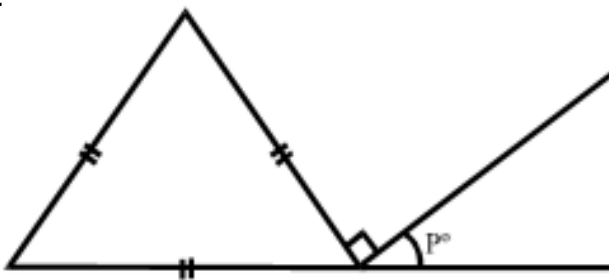
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7. A rectangular parcel of land measures 15 m x 20 m. What is the area of the parcel?



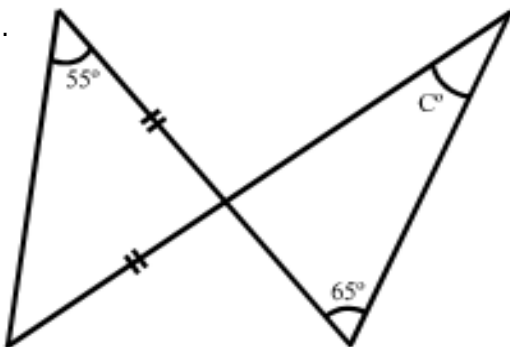
8. Solve the following diagrams for the missing elements:

a.



$$P^\circ =$$

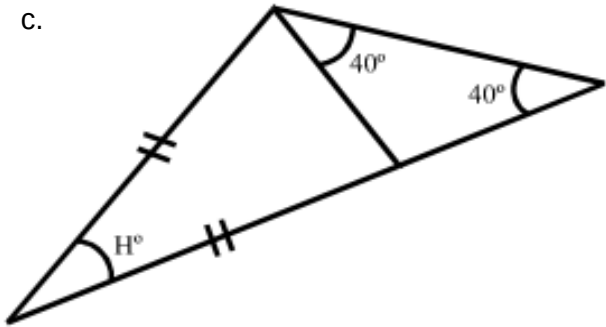
b.



$$C^\circ =$$

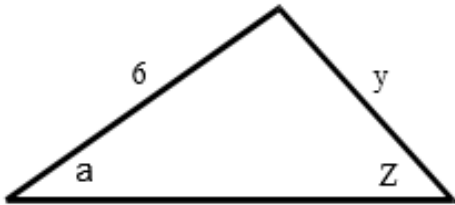
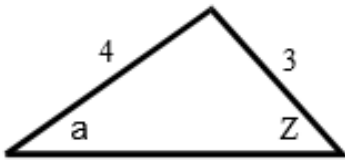
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c.



$$H^\circ =$$

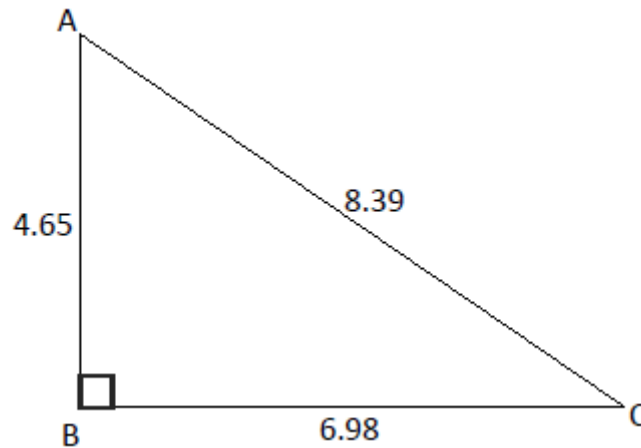
9. Calculate the length of side y given the two triangles:



$$y =$$

Practice Aptitude Quiz

10. In the right-angled triangle shown, which ratio correctly represents:



a. Tan A. Select the correct response:

$$\frac{4.65}{8.39}$$

$$\frac{8.39}{4.65}$$

$$\frac{8.39}{6.98}$$

$$\frac{6.98}{8.39}$$

$$\frac{4.65}{6.98}$$

$$\frac{6.98}{4.65}$$

b. Sin A. Select the correct response:

$$\frac{4.65}{8.39}$$

$$\frac{8.39}{4.65}$$

$$\frac{8.39}{6.98}$$

$$\frac{6.98}{8.39}$$

$$\frac{4.65}{6.98}$$

$$\frac{6.98}{4.65}$$

Practice Aptitude Quiz

11. What is three-quarters of 36? Select the correct response.

20

24

27

33

12. Two-thirds of a box of 24 survey pegs have been painted red. Another 2 pegs have been painted white. The remaining pegs have not been painted. What fraction of the pegs has not been painted? Select the correct response.

$\frac{1}{20}$

$\frac{1}{5}$

$\frac{1}{4}$

$\frac{3}{24}$

13. What is $4 - 1.07$? Select the correct response.

0.75

2.93

3.93

7.5

14. What is $4 - 0.3 \times 0.4$? Select the correct response.

1.2

2.2

3.88

14.8

15. What percentage is 18 of 24? Select the correct response.

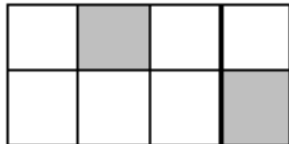
25%

40%

60%

75%

16. What percentage of the rectangle remains unshaded? Select the correct response.



75%

80%

25%

20%

Practice Aptitude Quiz

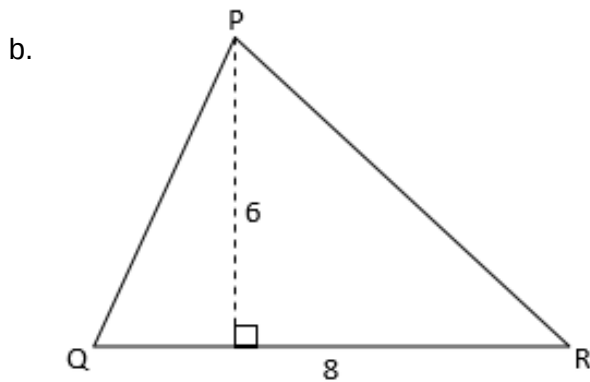
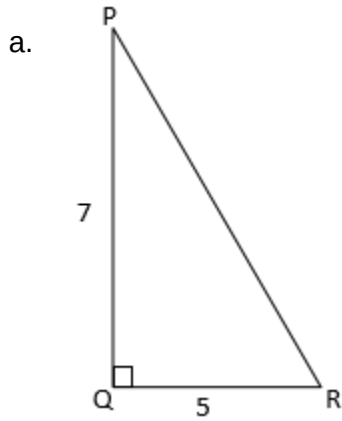
17. In the formula $\cos\theta = \frac{a}{h}$ if $\theta = 26.4723^\circ$ and $a = 21.709$. Calculate h :

18. Given that the volume of a cylinder $V = \pi r^2 h$ and $\pi = 3.141$, $r = 5.6$, $h = 7.2$, calculate the volume V :

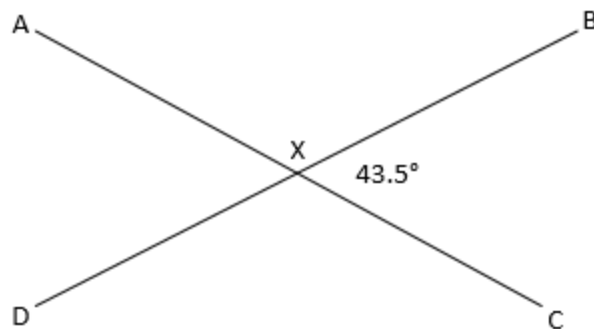
19. Calculate R given $R = \frac{A^2 + B^2 + C^2}{2AB}$ that $A = 24$, $B = 20$, $C = 18$:

Practice Aptitude Quiz

20. Calculate the area of the triangle PQR:



21. Calculate angles AXB and DXA:

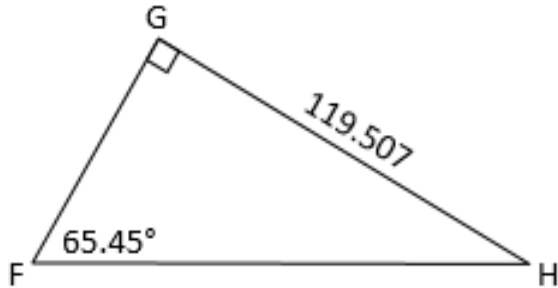


AXB _____

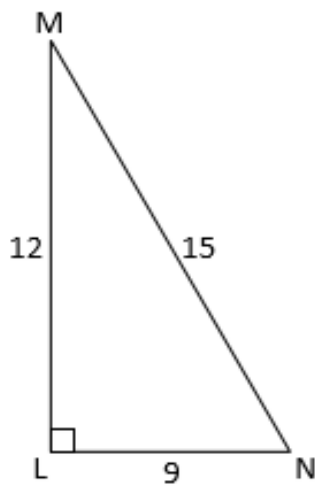
DXA _____

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22. In the right-angled triangle, calculate the length FH:



23. Calculate the value of the angles M and N:



M _____
N _____

24. Calculate the value for each of the following to 4 decimal places:

- a. $\cos 65^\circ$ _____
- b. $\sin 236^\circ$ _____
- c. $\tan 153.763^\circ$ _____

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25. Determine the angle for each of the following values (to 1 decimal place):

a. $\text{Cos}^{-1} 0.456324$

b. $\text{Sin}^{-1} -0.32571$

c. $\text{Tan}^{-1} 4.3279$

26. Calculate the following to one decimal place:

a. 34^2

b. $\sqrt{0.56}$

27. Helen is a Surveyor who is required to determine the volume of a parallel sided drain, measuring 10m long, 2m wide and 1m high. What was the volume she calculated, in cubic metres?

28. To assist with airport flight path planning, Anita has been asked to determine how far away from the end of the runway a plane will be if the plane is flying at 1500 m higher than the airport and approaching the airport at an angle of 5° . Calculate the distance from the end of the runway:

29. As a technician working on a redevelopment project Gregor needs to determine how many bricks are required to pave an area in front of a property, 21.6m long, between a road and a footpath 7.5m apart. Each brick measures 200 mm by 100 mm and is to be laid with the long side parallel to the road. Calculate the number of bricks required:

Practice Aptitude Quiz

ANSWERS

Section 1: Language and Literacy

1. a. separate b. unbelievable c. accommodation
2. a. heard b. which c. more easily d. they
3. a. Tessa asked, "Where are you going Jamie?"
b. Last August was the coldest month ever recorded.
4. a. The papers you gave to me has been filed in the storeroom.
b. The really long train moved quickly as it rounded the bends.
5. a. Deeds, leases, and other legal documents.
b. Survey Technicians assist the Surveyor to measure distances and angles. They write field notes and make sketches.
c. Cartographers collect facts about the earth's surface, prepare maps of large areas. Hydrographic Surveyors study harbours, rivers, and other bodies of water.
d. A GIS Technician.
e. Stand, walk long distances, climb hills, stay overnight, carry heavy packs, experience all types of weather.
6. a. vii, viii b. i, ii, iii c. iv, v, vi d. viii, ix e. v, vi

Section 2: Numeracy

1. a. 1850.31 b. 78.679
2. a. 1812 b. 3829.8
3. a. 247 b. 101.75
4. a. $Y = U + R - D - H + J - T$
b. $Y = K - H - (R - 3)$
c. $Y = \frac{(T - E)}{(E + 7)}$
5. a. Isosceles triangle b. Equilateral triangle
6. 5m
7. 300 m²
8. a. $P = 30^\circ$ b. $C = 45^\circ$ c. $H = 20^\circ$
9. 4.5
10. a. 6.98/4.65 b. 6.98/8.39
11. 27
12. $\frac{1}{4}$

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13. 2.93
14. 3.88
15. 75%
16. 75%
17. $h = 24.252$
18. $V = 709.213$
19. $R = 1.354$
20. a. 17.5 b. 24
21. $AXB = 136.5^\circ$ and $DXA = 43.5^\circ$
22. 131.384
23. $N = 53.13^\circ$ $M = 36.87^\circ$
24. a. 0.4226 b. - 0.8290 c. - 0.4929
25. a. 62.8° b. -19.0° or 341° c. 77.0°
26. a. 1156.0 b. 0.7
27. 20 m³
28. 17145 m
29. 8100 bricks