



Practice Aptitude
– QUIZ –

Engineering



Practice Aptitude QUIZ

PART 1: About this Engineering Resource

Guidance

This Practice Aptitude Quiz is intended to be a general illustration of some of the key learning standards required of people attempting an Australian Apprenticeships entry level qualification in the Engineering industry.

This Practice Aptitude Quiz is neither a formal tool nor a direct pre-requisite for any job application.

This quiz has been developed with the assistance of Industry and Registered Training Organisations, based on the needs and requirements of the Industry sector.

This Practice Aptitude Quiz has two components: Mathematics and Literacy. You will find that this quiz differs from similar tests administered by industry as their tests may have other elements included, that this one does not, such as: Mechanical Reasoning; Engineering Knowledge and reasoning and; General Knowledge.

The mathematical skills required to complete the questions contained within this document are equivalent to mathematics at the Year 10 level.

The quiz can be used by different organisations and people such as careers practitioners with young people, Group Training Organisations and Job Services Australia providers with job seekers.

The Practice Aptitude Quiz can be:

- Used by careers practitioners with individuals or in a class setting to provide general guidance on the level of study involved in undertaking an entry level qualification in this industry;
- Provided to people to enable them to practice their skills before sitting an actual aptitude test; and
- Used by teachers as a guide to industry maths requirements at the entry point of this particular Australian Apprenticeship career path.

The assessment should be able to be completed in approximately 1 hour and 20 minutes

Calculators may be used to complete this practice exercise.

Please note that rates quoted in this for various items, including pay rates, are not meant to reflect today's values, but are used purely for mathematical purposes.

Answers are located at the end of the quiz.

Engineering Career, Occupational Information and Job Hunting Resources

Information and links on the Engineering sector, careers, job prospects as well as career websites and job hunting resources can be found at

www.aapathways.com.au/Industry



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After the Quiz

There are a range of support services available to help you find out about courses that may help you improve your literacy and numeracy skills and also your readiness for work.

If you are still at school you should discuss any concerns you may have with your career practitioner. Further information may also be provided by an employment service provider, an Australian Apprenticeships Support Network (Apprenticeship Network) provider, a Group Training Organisation or a training provider.

Useful Contacts

Here are some links to job seeker support services:

Search for your local Australian Apprenticeships Support Network (Apprenticeship Network) provider www.aapathways.com.au/sps

Find a local Group Training Organisation www.grouptraining.com.au/Find/find_gto.html

Employment service providers work with eligible job seekers to develop an individually tailored plan. The plan maps out the training, work experience and additional assistance needed to find job seekers sustainable employment - <https://jobsearch.gov.au/>



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Part 2: The Quiz

Section 1 – Literacy, Reading and Comprehension

Spelling

1. Write the following words or group of words into alphabetical order.

Toolmaker	
Engineering	
Computer aided manufacture	
Boilermaker	
Weighing	
Computer numerical controlled	
Computer aided design	
Welders	
Engineering patternmakers	
Design moulds	

2. The following text has 10 spelling errors. Correct those errors and list them in the order you find them.

Toolmackers make precision equipement and tools used to manufacture mechinary. They use precision measuring equipment and may use CNC machines and computer ayded manufacturing (CAM) systems to acheive very precise finishes and sises. Any company manufactring presed metal or plastic items requires the service of a toolmacker.

1.	6.
2.	7.
3.	8.
4.	9.
5.	10.



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- 3. The following text has 12 spelling and grammar errors. Correct those errors and list them in the order you find them.**

Computer Aided Design (CAD) systems are used by Mechanical Drafttters to simulate the preformance of a product. They can test weather a brige will carry predicted lodes safely, or even wether tomatoe sauce will pore correctly from a newlee designed container.

1.	7.
2.	8.
3.	9.
4.	10.
5.	11.
6.	12.

Comprehension

- 4. Read the following passage and answer the questions that follow.**

Engineering Health and Safety

In the engineering trades, you are constantly using your mind and body to maintain and repair products. This means you need to look after yourself carefully to have a long and safe career.

It is important to receive the correct information, training and supervision throughout your apprenticeship to protect your safety. At times, you may feel under pressure to take on tasks you haven't been adequately trained for or to rush and cut corners for a job you need to get done quickly. Any of these things could lead to an injury or an accident.

Let's look at the main hazards of engineering and the way we can control and protect ourselves and our workmates.

Burns are common in engineering and are often caused by poor preparation or not using the correct safe work procedures or Personal Protective Equipment (PPE). Different types of processes can cause different types of burns. Welding can cause radiation burns or hot pieces of material can fly towards you. While machining metals and hot materials could also burn you. Welding can produce sparks that can easily start a fire so you need to ensure that no rags, loose clothing or combustible materials are in your work area. Every engineering process that can cause burns will have a safe work procedure and PPE designed to keep you and those around you safe.



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Lacerations are cuts to the body with the hands being the most common part of the body injured by cuts. Sharp tools like knives and cutting tools are an obvious cause of lacerations. Handling sheet metal is another hazard. Using lathes, milling machines and drills can produce flying debris called swarf which is extremely sharp. Never try and remove swarf by hand. There are tools available to safely remove swarf. Lacerations can lead to serious injury so don't rush or take short cuts.

Injuries from manual tasks can occur as a result of repetitive actions, poor or awkward postures, exerting high force to push, pull or lift heavy things, and vibration. These hazardous activities can lead to serious muscular or skeletal injuries that can either appear suddenly or over a long period of time. In any situation, it is very important to use correct lifting techniques to pick things up or move them. If you think something is going to be heavy or awkward to lift use a mechanical aid or lifting device or get help. When you move an object make sure you have a clear pathway with no obstructions so you can see where you are going without tripping over anything. If you spill anything or see anything spilt on the floor clean it up straight away. You or someone else could slip and fall.

It's surprising how much we take our eyes and ears for granted but in workshops and on site there are a multitude of hazards to both our sight and our hearing. Grinding, cutting and welding and using lathes, milling machines and drills are all processes that produce flying debris. Without correct protection particles could get in your eyes. There are different types of eye protection for different jobs. Sometimes you'll need a full-face shield instead of goggles depending on whether you are cutting, grinding or drilling for instance.

Many tradespeople in their later years may experience some degree of hearing loss. This can often be due to not using the correct hearing protection during their career. Engineering work creates a range of noises that can damage your hearing. Both long term exposure and sudden loud bursts of noise can lead to hearing loss and damage to hearing is generally irreversible.

Don't think it won't happen to you, be safe at work!

Answer the following questions:

- a. Looking at paragraph two, what are the three critical things required to protect your safety?**

- b. What are the main hazards of engineering?**



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c. There are different types of burns. What are they?

d. Name 2 types of PPE mentioned in the text.

e. What hazardous activities can lead to muscular or skeletal damage?

Section 2 - Mathematics

Numbers (Conversion, Estimation & Time)

1. Convert the following:

- a. \$2.41 to cents _____
- b. 182 days to weeks _____
- c. 3 hours & 12 seconds to seconds _____
- d. 8 kilometres to metres _____
- e. 3.5 kilograms to grams _____

2. How many hours and minutes from 7:45 am to 3:15 pm?



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3. Select the best estimate for the following: (Circle the correct response)

a. $4,249 \times 71$

I. 280,000

II. 150,000

III. 28,000

b. $80,000 \div 38$

I. 200

II. 2,000

III. 20,000

IV. 4,000

4. Round:

a. 35.6754 to two decimal places

b. 425.8 to the nearest tens

5. Find the decimal number halfway between:

a. 0.6 and 0.8

b. 2.8 and 2.9

6. Circle the correct answer to:

$18.642 \div 0.02$

a. 9.321

b. 93.21

c. 9321

d. 932.1



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7. Munro, a qualified tradesperson earns \$1,100 a week. He gets a pay rise of 5%. What is his new wage?

8. 1000 brackets are manufactured. 60% need to be delivered in 24 hours. How many brackets are required?

9. In an order of 2000 hexagonal nuts, 40 were defective. What percentage were:

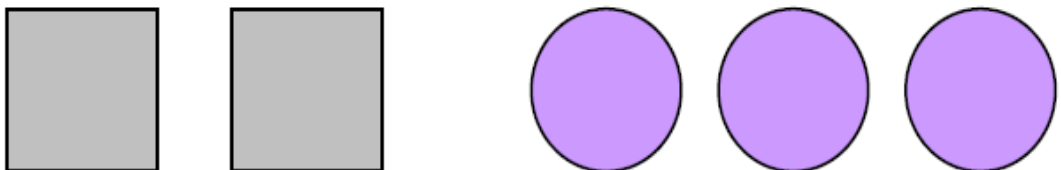
a. Defective

b. Good

10. The price of a micrometre is normally \$84. During a sale, there was a 25% reduction. Calculate the sale price?

Ratio

11. What is the ratio of the number of circles to squares?



Ratio: _____

12. A cutting wheel cuts through 0.5 cm of steel in 1 minute. How long will it take to make a cut 3.5 cm deep?

_____ minutes



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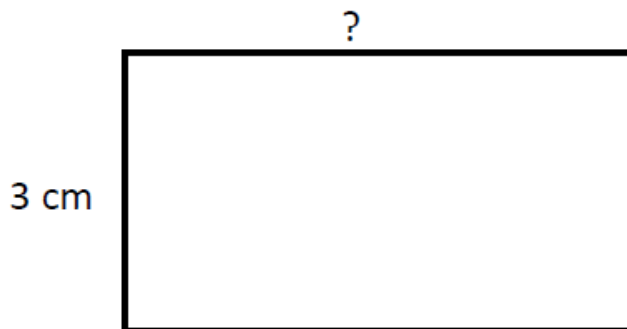
13. An air conditioning unit circulates 320 cubic metres of air per minute. How many cubic metres of air is circulated in an hour?

_____ m³

14. Two gears have 12 and 15 teeth respectively. What is the ratio of the number of teeth on the first gear to the number of teeth on the second gear in lowest terms?

Area

15. The area of a tin plate is 15 cm². Its width is 3 cm. Find the length of the plate?



Length = _____

16. A piece of wire is 24 mm long and is bent in the shape of a rectangle so that the length is twice its width. Find the area of the rectangle?



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17. A square is inscribed in a circle of radius 5 m.

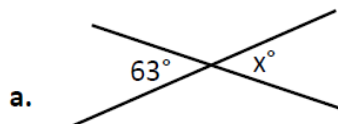
Calculate:

- The area of the circle (Correct to two decimal places)
Hint: Use the formula $A = \pi r^2$, where $\pi = 3.14$.
- The diameter of the circle
- The value of x . (Correct to two decimal places)
Hint: you'll need to use Pythagoras's Theorem: $a^2 + b^2 = c^2$
- The area of the square. (Correct to two decimal places)

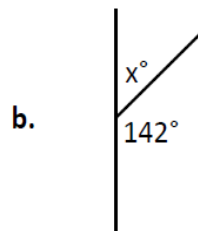
	a.
	b.
	c.
	d.

18.

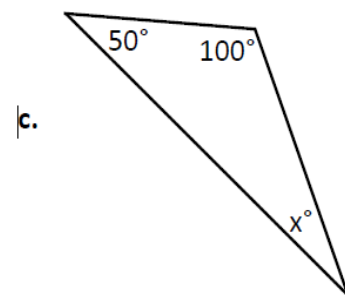
Find the value of x :



X = _____



X = _____

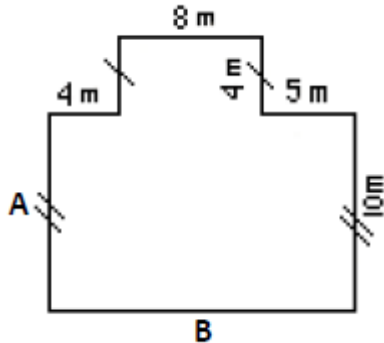


X = _____



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19. From the sheet metal shown, calculate the unmarked lengths 'A' and 'B'.

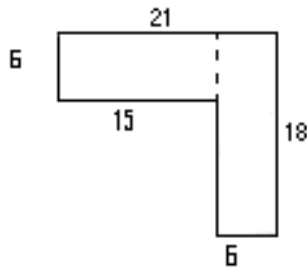


a. A =
b. B =

20. Calculate the area of the shapes shown? For b. use $\pi = 3.14$

All calculations are in mm. (Hint - round up)

a.



b.



Area = _____

Area= _____

Problem Solving

21. Irenka the engineer is paid \$27.00 per hour plus time and a half for any hours over 35 hours. If she worked 42 hours, what was her pay for:

a. The first 35 hours work? _____

b. The overtime work only? _____

c. Total pay? _____



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22. An engineer cut two pieces of metal rod each $10\frac{1}{2}$ cm long from a rod 50 cm long. How much of the original rod was left?

23. The weight of three bolts are 52 g, 49 g, and 61 g. What is the average weight of the bolts?

24. A 4-metre length of steel is cut into 5 equal sections. How long is each piece (ignoring the saw cuts)?

25. A machinist drills a hole 65 mm into a block of steel 10 cm thick. How much further is left to drill?

26. The following lengths were cut from a piece of angle iron: 8 cm, 27 cm, 41 cm, 37 cm, and 16 cm. What was the total length cut? (ignore the saw cuts)

27. A welder requires 8 welding rods to weld a bracket into place. How many welding rods are required to weld 12 brackets?

28. Nine similar pieces of sheet metal have a total thickness of 0.27 cm. What is the:

a. Thickness of 1 piece _____

b. Thickness of 4 pieces _____

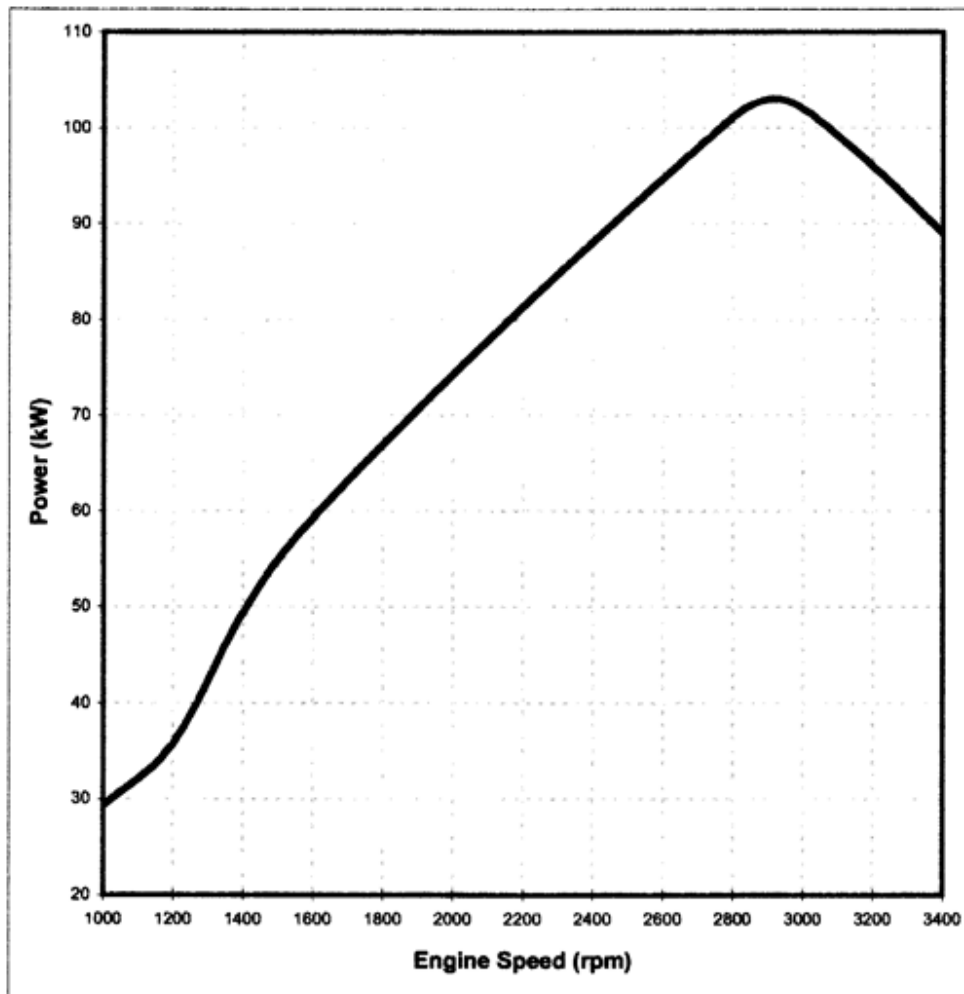
29. An assembly worker takes 30 seconds to build a component. How many components can be assembled in 1 hour?



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30. If one litre of paint covers 12 square metres, how many litres of paint is needed to paint a lounge room which has an area of 36 square metres?

31. Looking at the graph, complete the table below.



Power KW	RPM
	1400
60	
	2300

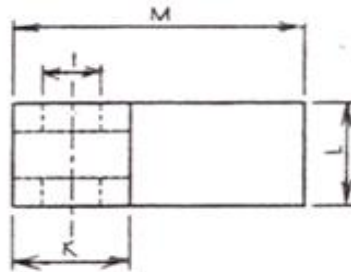


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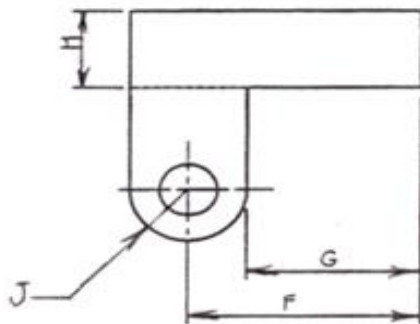
32. Drawing Reading Exercise

From the orthographic drawings shown below, fill in the missing dimensions.

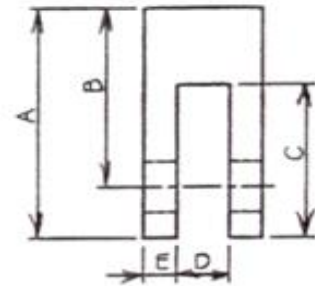
Please note that the drawing is not to scale.



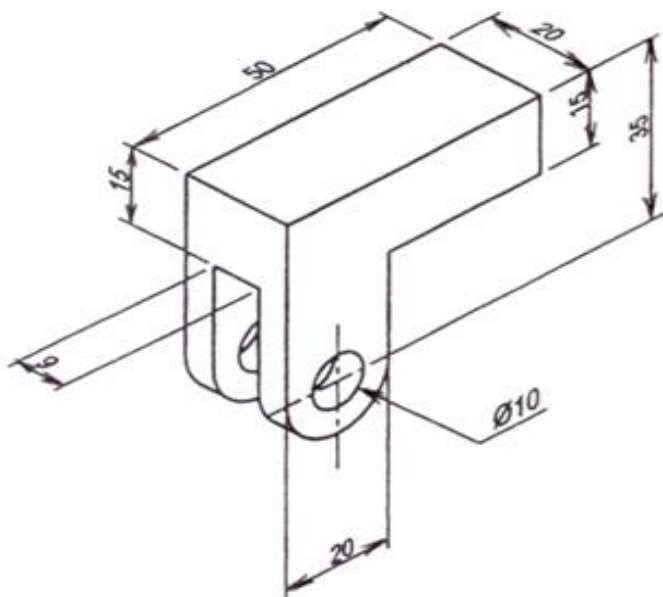
TOP VIEW



FRONT VIEW



RIGHT SIDE VIEW



- A = _____
- B = _____
- C = _____
- D = _____
- E = _____
- F = _____
- G = _____
- H = _____
- I = _____
- J = _____
- K = _____
- L = _____
- M = _____



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Answers

Section 1 - Literacy, Reading & Comprehension

1. Boilermaker, Computer aided design, Computer aided manufacture, Computer numerical controlled, Design moulds, Engineering, Engineering patternmakers, Toolmaker, Weighing, Welders
2. Toolmakers, equipment, machinery, aided, achieve, sizes, manufacturing, pressed, requires, toolmaker
3. Aided, systems, Mechanical, Drafters, performance, whether, bridge, loads, whether, tomato, pour, newly
4.
 - a. Correct information, training instruction and supervision throughout your apprenticeship
 - b. Burns, lacerations, injuries from manual tasks, sight and hearing hazards
 - c. Radiation burns, burns from sparks
 - d. Face shield, goggles
 - e. Repetitive actions, poor or awkward postures, exerting high force to push, pull or lift heavy things, vibration

Section 2 – Mathematics

1. a. 241 cents b. 26 weeks c. 10,812 seconds d. 8,000 m e. 3,500g
2. 7 hours & 30 minutes
3. a. 280000 b. 2000
4. a. 35.68 b. 430
5. a. 0.7 b. 2.85
6. d. 932.1
7. \$1,155
8. 600
9. a. 2% b. 98%
10. \$63
11. 3:2
12. 7 minutes
13. 19,200 m³
14. 4:5
15. 5 cm
16. 32 mm²
17. a. 78.5 m² b. 10 m c. $\sqrt{50} \text{ m} = 7.07$ d. 49.98 m²
18. a. 63° b. 38° c. 30°
19. a. 10 m b. 17 m
20. a. 198 mm² b. 357 mm²



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21. a. \$945 b. \$283.50 c. \$1,228.50

22. 29 cm

23. 54 g

24. 0.8 m

25. 35 mm

26. 129 cm

27. 96 welding rods

28. a. 0.03 cm b. 0.12 cm

29. 120 components

30. 3 litres

31.

POWER kW	RPM
50	1400
60	1600
85	2300

32.

a. 45 b. 35 c. 30 d. 9 e. 5.5 f. 40

g. 30 h. 15 i. 10 j. 10 k. 20 l. 20

m. 50



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This Practice Aptitude Quiz was developed by



Australian Apprenticeships and Traineeship Information Service, which delivers the [Australian Apprenticeship Pathways](#) website, [MyGain](#) (YouTube channel) and [AusAppPathways](#) – Mobile App. The service provides sample Australian Apprenticeships job descriptions and links to more Australian Apprenticeships information and resources. The service is funded by the Australian Government, Department of Education and Training.



The Australian Centre for Career Education - www.ceav.vic.edu.au

The Australian Centre for Career Education is a state based peak association for career practitioners working in a range of educational settings. The ACCE provides membership, training and professional development aligned to the national standards for career practitioners. It also provides careers counselling to the general public and consultancy to industry and governments.



Apprentice Employment Network (SA) – www.aensa.com.au

Apprentice Employment Network (SA), (AEN SA), Formally known as Group Training Australia (SA) is a network of independent not for profit organisations located in metropolitan Adelaide and all major population centres across South Australia. These organisations work on either an industry or regional basis and collectively they provide employment for approximately 3000 apprentices and trainees.

Search for your local Group Training Organisation at: www.aapathways.com.au/sps

**For enquiries about this Practice Aptitude Quiz, contact
The Australian Apprenticeships and Traineeships Information Service on
1800 338 022**