

Practice Attitude Quiz



**Automotive Repair
& Maintenance**

Automotive Repair & Maintenance

Practice Aptitude Quiz

It is crucial for young people to build their career management skills so they can make informed choices regarding their study and training options and navigate a pathway towards their occupation and career of choice.

This career development resource combines labour market information with a practical industry specific activity to help develop awareness about the skills required to pursue a career pathway in the Automotive Repair and Maintenance Industry.

PART 1: About the Automotive Repair & Maintenance Industry

1. The Automotive Repair & Maintenance Industry in a nutshell

Key sectors:

- > Heavy Vehicle
- > Light Vehicle
- > Marine
- > Mobile Plant
- > Motorcycles
- > Outdoor Power Equipment
- > Electrical/Electronics
- > Vehicle Body

Automotive Repair and Maintenance is part of the much broader Automotive Retail, Service and Repair Industry. The Retail, Service and Repair Industry is a significant employer, employing an estimated 308,000 people as at May 2009 with over one third of personnel employed in the Automotive Repair and Maintenance area.

The Automotive Repair and Maintenance Industry is involved in the upkeep of every component of motor vehicles, from bodies and interiors to the mechanical and electrical systems. It includes the reconditioning and conversion of engines, both non-factory based engine reconditioning and the conversion of cars from left to right-hand drive.

2. **Key occupation information** (Sources Job Outlook - www.joboutlook.gov.au and Australian Jobs 2011 www.deewr.gov.au/Employment/ResearchStatistics/Documents/AustralianJobs.pdf)

Weekly average earnings for major occupations:

- | | |
|--|---|
| > Light Vehicle Mechanic - \$840 | > Heavy Vehicle Road Transport Mechanic - \$840 |
| > Heavy Vehicle Mobile Equipment Mechanic - \$840 | > Forklift Mechanic - \$840 |
| > Motorcycle Mechanics Agricultural Mechanic - \$840 | > Gas Vehicle Installer - \$840 |
| > Agricultural Mechanic - \$840 | > Panel Beater - \$950 |

Jobs and demand information

Automotive Mechanical Tradespersons carry out diagnostic procedures, testing, servicing and repair of vehicles.

Automotive Mechanical Tradespersons may work as:

- **Light Vehicle Mechanics** who service and repair the mechanical parts of motor vehicles such as engines, transmissions (clutch, gear box and differential) and suspension systems.
 - **Heavy Vehicle Mobile Equipment Mechanics** who overhaul, service and repair the mechanical parts of heavy mobile equipment such as the engine, transmission (clutch, gear box and differential) and the suspension systems (springs, steering, brakes, wheels and tyres).
 - **Motorcycle Mechanics** who use diagnosis procedures to determine faults, repair and servicing of engines and engine components, cooling systems, petrol fuel systems, emission control systems, clutch assemblies, manual transmissions, drivelines, braking, steering and suspension systems.
 - **Agricultural Mechanics** who overhaul, service and repair the mechanical parts of agricultural equipment such as the engine, transmission (clutch, gear box and differential) and the suspension systems (springs, steering, brakes, wheels and tyres).
 - **Heavy Vehicle Road Transport Mechanics** who service and repair the mechanical parts of road transport vehicles such as the engine, transmission (clutch, gear box and differential) and the suspension systems.
- > Job prospects - Above average
 - > Weekly earnings - \$800
 - > Occupation size - 98,000

Potential entry level qualification:

- > Certificate II in Automotive Vehicle Servicing
- > Certificate III in Automotive Mechanical Technology

Automotive Specialist Tradespersons carry out diagnostic procedures and test, service and repair vehicle components.

Automotive Specialist Tradespersons may work as:

- **Brake Specialists** who diagnose, overhaul, repair or replace and test the parts of disc, drum or power brake systems used on motor vehicles including cars, trucks, buses and semi-trailers.
- **Diesel Fitters** who perform diagnostic procedures, service, repair and overhaul engines and associated components and repair and service cooling systems, diesel fuel systems, emission control systems and air compressors or components.
- **Diesel Fuel Specialists** carry out diagnostic procedures, overhaul and repair diesel fuel systems and components, service diesel fuel injection systems and service and repair emission control and engine force induction systems.
- **Driveline Specialists** who work on light or heavy vehicles, motor cycles, plant and outdoor equipment performing diagnostic procedures, servicing, repairs and overhaul of clutch assemblies and overhaul, servicing and repairs of manual or automatic transmissions and final drive assemblies and driveline.
- **Engine Reconditioners** who set up and operate machinery to restore and recondition the machined surfaces of vehicle components.
- **Forklift Mechanics** who set up and operate machinery to restore and recondition the machined surfaces of vehicle components.
- **Gas Vehicle Installers** who undertake diagnostic procedures, overhaul, repairs and servicing of engines and associated components, repairs, servicing and installation of natural gas fuel systems and repairs and servicing of petrol fuel and emission control systems.
- **Steering and Suspension Mechanics** who perform diagnostic procedures to determine symptoms or faults then service and repair steering and suspension systems for light or heavy vehicles, plant, motor cycles, marine and outdoor power equipment.
- **Transmission mechanics** who work on light or heavy vehicles, motor cycles, plant and outdoor power equipment carrying out diagnostic procedures, servicing, repairs and overhaul of automatic transmissions and final drive assemblies.
- **Trailer Technicians (Heavy Vehicle)** who carry out diagnostic procedures, servicing, repairs and overhaul of automatic transmissions and final drive assemblies.

> Job prospects - Above average

> Weekly earnings - \$800

> Occupation size - 98,000

Potential entry level qualification:

> Certificate II in Automotive Mechanical

> Certificate III in Automotive Specialist

Automotive Electricians install, maintain, diagnose faults and repair electrical wiring and computer based equipment in cars, trucks, caravans, trailers, earthmoving and agricultural equipment and boats.

- > Job prospects - Above average
- > Weekly earnings - \$1,030
- > Occupation size - 9,300

Potential entry level qualification:

- > Certificate II in Automotive Electrical Technology
- > Certificate III in Automotive Electrical Technology

Automotive Vehicle Body Tradespersons repair vehicle bodies within a selected specialty area of the Automotive Retail Service and Repair industry.

Automotive Vehicle Body Tradespersons may work as:

- **Vehicle Body Builders** who repair vehicle bodies (that may include buses, caravans, tray and van bodies, semi-trailers, refrigerated vans, horse floats, fire and police vehicles), and manufacture and modify purpose-built bodies to fit other manufacturers' chassis.
- **Panel Beaters** who repair damage to metal, plastic and fibreglass bodywork on vehicles and make and form vehicle panels using machines or hand tools.
- **Vehicle Glazers** who operate out of a mobile service unit or workshop repairing or replacing windscreens and side and rear glass to motor vehicles such as cars, trucks and vans.
- **Vehicle Painters or Spray Painters** who carry out masking procedures, colour matching and mixing of paints, application of primer and finishing coats and polishing and waxing the finished paint work.
- **Vehicle Trimmers** who make, install, repair or modify the seats, upholstery, linings, interior trim, roof and door linings and floor coverings of vehicles such as cars, trucks, vintage vehicles, buses, caravans, trains, aircraft and boats.

- > Job prospects - Above average
- > Weekly earnings - \$1,030
- > Occupation size - 9,300

Potential entry level qualification:

- > Certificate II in Automotive Vehicle Body
- > Certificate III in Automotive Vehicle Body

About the qualifications

Qualifications provide the core skills, knowledge and experience (competencies) required for effective performance on the job plus the option of choosing a range of elective competencies that meet the needs of the employer and the individual.

Every qualification includes an emphasis on “Employability Skills” or the skills that employers identify as playing a significant part in contributing to an individual’s effective and successful participation in the workplace.

Employability skills are non-technical skills. They are also sometimes referred to as generic skills, capabilities, enabling skills or key competencies. The Employability Skills are:

- > **Communication skills** that contribute to productive listening and understanding, speaking clearly and directly and harmonious relations across employees and customers;
- > **Teamwork skills** that contribute to productive working relationships and outcomes;
- > **Problem-solving skills** that contribute to productive outcomes;
- > **Initiative and enterprise skills** that contribute to innovative outcomes;
- > **Planning and organising skills** that contribute to long and short-term strategic planning;
- > **Self-management skills** that contribute to employee satisfaction and growth;
- > **Learning skills** that contribute to ongoing improvement and expansion in employee and company operations and outcomes;
- > **Technology skills** that contribute to the effective performance of tasks.

3. Career Pathways

- > Apprenticeships Pathways - view potential career pathways for this industry - Go to www.aapathways.com.au/search_job_02.cfm?c=9

Other useful careers sites are:

- > My Future - www.myfuture.edu.au
- > Job Guide - www.jobguide.thegoodguides.com.au
- > Career Factsheets - www.ncdw.com.au/index.php/Career-Factsheets.html

4. Job Hunting

Job vacancy website:

- > [Australian Jobsearch - www.jobsearch.gov.au/findajob/advancedsearch.aspx](http://www.jobsearch.gov.au/findajob/advancedsearch.aspx) The Australian Government's job site. Input your postcode, then input the key word "Technicians and Trade Workers", then go to "Specific Occupations and click on "Motor Mechanics", then go the "Additional Search Criteria" section and click on "Apprenticeships/Traineeships", then click on the "Find Jobs" button.

Job hunting hints and labour market information:

- > Australian Apprenticeships Pathways - www.aapathways.com.au Click on "Search" to find potential Australian Apprenticeships occupation ideas. You can also find Job Hunting hints in the "Self Help" menu item.
- > My Future: Labour Market Information - www.myfuture.edu.au/services/default.asp?FunctionID=5400 Click on the map or use the drop down menu to find general labour market information for your region including top occupations and incomes. Data is based on the most recently available census.

5. Useful Contacts

Here are some links to a range of support services, organisations and government agencies that may help with careers research and job hunting:

Support services:

- > Search for your local Australian Apprenticeships Centre - www.aapathways.com.au/search_aac.cfm
- > Group Training Organisations employ Australian Apprentices and place them with businesses - www.grouptraining.com.au
- > Job Services Australia providers work with eligible job seekers to develop an individually tailored Employment Pathway Plan. The plan maps out the training, work experience and additional assistance needed to find job seekers sustainable employment - www.jobsearch.gov.au/provider/ProviderLocation.aspx?ProviderType=JNS&

Industry Organisations:

- > Auto Skills Australia Ltd - www.autoskillsaustralia.com.au
- > AMWU - www.amwu.asn.au
- > Federal Chamber of Automotive Industries - www.fc.ai.com.au

Government Agencies:

- > Department of Innovation, Industry, Science and Research - www.innovation.gov.au

PART 2: About this 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 Automotive Repair and Maintenance 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 three components: Literacy, Reading and Comprehension; Mathematics and; General Knowledge. The mathematics 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;
- > used by teachers as a guide to industry math requirements at the entry point of this particular Australian Apprenticeship career path.

The Quiz should be able to be completed in approximately 1 hour and 30 minutes.

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.

Calculators may be used to complete this practice assessment, but the majority of the quiz should be attempted without calculators.

Answers are located at the end of the quiz.

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 a Job Services Australia provider, an Australian Apprenticeships Centre, 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 Centre - www.aapathways.com.au/search_aac.cfm
- > Find a local Group Training Organisation - www.grouptraining.com.au/Find/find_gto.html
- > Job Services Australia providers work with eligible job seekers to develop an individually tailored Employment Pathway Plan. The plan maps out the training, work experience and additional assistance needed to find job seekers sustainable employment - www.jobsearch.gov.au/provider/ProviderLocation.aspx?ProviderType=JNS&

Part 3: The Quiz

QUIZ

Section 1 - Literacy, Reading and Comprehension

1. Write the following vehicle components in alphabetical order:

Timing cover	_____
Cam shaft	_____
Rocker cover	_____
Valve	_____
Cam gear	_____
Sump	_____
Piston	_____
Alternator	_____
Bonnet	_____
Cam timing belt	_____

2. Write the plural of the following words:

Mechanic	_____
Woman	_____
Branch	_____
Child	_____
Sheep	_____

3. Circle the correct spelling of each word

a.	dynamometer	dinamometer	dynamonitor	dinomonitor
b.	vacuum	vacoom	vakuum	vaccum
c.	differential	differencial	differentil	differenteal

4. The following text has 10 spelling errors in it. Correct those errors and list them in the order you find them in the table on the following page.

This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. If the recipient of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited and may be unlawful.

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

5. The following text has 5 spelling errors in it. Correct those errors and list them in the order you find them in the text.

Maintenance shedules for cars are very important. Lubrication and the replacment of worne spark plugs need regular atention.

1.
2.
3.
4.
5.

6. Read the following article and answer the questions that follow.

Cars of today rely more and more on computers, compared to the cars of the past. Technology is getting more advanced and the automobile industry has always been trying to use that to their advantage. The whole car is becoming a computer, more and more functions that used to be operated manually are now done electronically. The millions of microprocessors do a great amount of tasks. The engine and parts under the hood power the car, but it's the microprocessors that tell it what to do. You would be surprised exactly how many functions have something to do with computers.

Some of the major microprocessors are: the airbag module; Engine Control Unit (ECU) which controls the engine functions; the driver's door module; climate control module; cruise control module; the transmission controller which controls automatic transmission; and ABS module which controls the anti-lock brakes and may handle the traction-control and stability-control systems.

The microprocessor that is the most important is the ECU. It controls engine functions like the spark timing and obtaining the correct fuel to air mixture to intake into the engine block. It can also manage the emissions and the fuel economy of the car. It does so by creating the perfect ratio of fuel/air mixture.

Cars today may have as many as 100 microprocessors, many of which make them easier to service. Every engine, every vehicle and every computer system is different - but all the sensors and all the output devices must be in perfect "sync" for cars, minivans, trucks and 4WDs to run efficiently.

Some of the reasons for the increase in the number of microprocessors are:

- > The need for sophisticated engine controls to meet emissions and fuel-economy standards.
- > Advanced engine diagnostics and repair.
- > Reduction of the amount of wiring in cars.
- > New safety features.
- > New comfort and convenience features.
- > New entertainment and communication features.

Questions:

a. Name 3 of the microprocessors commonly used in cars.

b. What is one reason for the increase in the number of microprocessors?

c. What is the most important microprocessor and what function does it have?

7. Read the following passage and answer the questions which follow.

Automotive Mechanic

The job of the Automotive Mechanic has certainly changed in the last decade with the introduction of computer technology. The automotive industry has become more sophisticated and high-tech, and so too have the skills of the Automotive Mechanic.

What sort of training do you need?

To become an Automotive Mechanic usually requires the completion of an Australian

Apprenticeship, which is based on a Certificate III in Automotive Mechanical Technology or a Certificate III in Automotive Specialist.

The length of the training can vary and will involve both on-the-job and off-the-job components. The off-the-job training is provided through a training provider.

Employers generally require at least the completion of Year 11 with good results in English, Maths and Science. Many people complete Year 12 before entering an Australian Apprenticeship.

You may be able to start training for this occupation while still at school.

Automotive Mechanics may progress to positions such as a Service Manager, Workshop Foreman, Service Advisor, Technical Sales Representative, Technical Officer or Diagnostic Specialist.

What sort of things do Automotive Mechanics do?

- > Discuss problems with car drivers or vehicle operators to discover faults, listen to engines, fit and operate special test and diagnostic equipment and test drive vehicles.
- > Repair or replace worn and faulty parts by removing and dismantling assemblies.
- > Reassemble, test, clean and adjust repaired or replaced parts or assemblies, use various tools and equipment to make sure they are working properly and put them back into the vehicle.
- > Diagnose, repair and replace engine management and fuel injection components.
- > Inspect vehicles and issue roadworthiness certificates or list the work required before a certificate can be issued.

You may enjoy being an Automotive Mechanic if you:

- > Are interested in practical and manual work;
- > Are able to work with hand tools;
- > Have a technical aptitude;
- > Have problem-solving skills.

Questions:

Circle the correct response to the following five questions.

- a. To become an Automotive Mechanic, I need to complete:
 - i. A Bachelor in Automotive
 - ii. A Diploma in Automotive
 - iii. An Automotive Apprenticeship
 - iv. A Masters in Automotive

b. Employers usually require you to have completed at least:

- i. Year 10
- ii. Year 11
- iii. Year 12
- iv. Year 13

c. Which of these skills do you believe an Automotive Mechanic needs:

- i. Listening
- ii. Communication
- iii. Writing
- iv. Listening, Communication and Writing

d. Automotive Mechanics:

- i. Make inspections of light vehicles
- ii. Issue roadworthiness certificates
- iii. Repair engine components
- iv. All of the above

8. Personal Protective Equipment includes clothing, equipment and substances designed to be worn by a person to protect them from risks of injury or disease.

Below is a list of Personal Protective Equipment (PPE) commonly used in automotive workshops.

PPE	Use in a Mechanical Workshop
Safety glasses	To protect eyes from debris, when panels are sanded.
Overalls	Protects against fluids or chemicals causing damage to clothing and skin. Essential when doing spray work.
Gloves (light weight)	Protects hands from solvents and fluids.
Gloves (heavy weight)	Protects against chemicals, for example when using parts wash.
Face shield	To protect eyes and face from flying materials created when grinding or drilling.
Steel capped boots	Protects feet/toes from injury caused by dropping heavy items.
Ear muffs or ear plugs	Used to reduce hearing damage caused by loud noises such as air rattle gun, air chisel, hammering.
Respirator	Protects lungs from inhalation of dust, fumes.
Leather apron	Protects body and clothing from burns generated from welding.
Leather gloves	Protects hands and arms from burns generated from welding.
Welding mask	Protects eyes from damage from welding.
Cap/hair net	Reduces risk of hair getting caught in rotating equipment such as drills, grinders.

QUIZ

- a. Looking at the table on the previous page, what PPE would you used to avoid burns when undertaking a welding job?

- b. When working with fluids or chemicals what PPE would you use?

- c. How can you protect your feet from falling heavy objects?

- d. To prevent dust inhalation and protect your hearing from loud noises what PPE would you wear?

9. What personal protective equipment do you think you would need in the following situations?

- a. Grinding

- b. Handling a car battery

- c. Spray painting a car

d. Panel beating

e. Sanding

10. Below is a photo of typical automotive workshop.



a. What major hazards can you see?

b. What measures have been put in place to minimise the hazards?

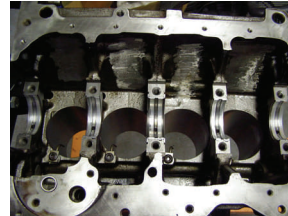
Section 2 - General Knowledge

1. The pictures below are of vehicle components. Write the name of the component (from the following list) below the correct picture.

Cylinder block, sump, spark plugs, alternator, rocker cover, piston, fuel injector, carburettor.



a. _____



b. _____



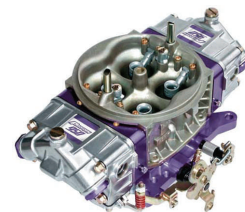
c. _____



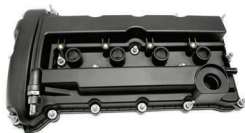
d. _____



e. _____



f. _____



g. _____



h. _____

2. Below is a list of tools. Write the name of the tool below the correct picture.

Open ended spanner, vice grips, needle nose pliers, hacksaw, centre punch, tin snips, micro meter, Phillips head screwdriver.



a. _____



b. _____



c. _____



d. _____



e. _____



f. _____



g. _____



h. _____

3. Below is a list of car body parts. Write the name of the body part below each picture.

Bumper bar, door, skirt, bonnet, boot, wing mirror, windscreen, wiper arm.



a. _____



b. _____



c. _____



d. _____



e. _____



f. _____



g. _____



h. _____

4. Which of the following words reflect electrical terms or components? Circle the correct responses.

Drive shaft	Volt
Current	Washer
Wheel cylinder	Ohms
Spring	Diode
Resistor	

Section 3 - Mathematics

Numbers (Measurement, Scales, Decimals, Rounding, Estimates, Scientific Notation)

1. Which unit from the table below would you use to measure:

- | | |
|----------------|-------|
| a. length | _____ |
| b. time | _____ |
| c. temperature | _____ |
| d. weight | _____ |
| e. area | _____ |
| f. speed | _____ |
| g. volume | _____ |
| h. cost | _____ |

kg	ml	km/hr	m ²
\$	m	min	°C

2. What are the following tape readings:



3. From the list of numbers in the table below, select the one which represents a:

- a. percentage _____
- b. decimal number _____
- c. fraction _____
- d. mixed number _____
- e. ratio _____
- f. angle _____

$\frac{3}{8}$	35°	25%
5:4	16.37	$2\frac{3}{4}$

4. Convert the following:

- a. 8 kilometres to metres _____
- b. 3.5 kilograms to grams _____

5. Write the following decimal numbers, from largest to smallest:

8.23	82.3	0.823
------	------	-------

6. Find the decimal number halfway between:

- a. 0.6 and 0.8 _____
- b. 2.8 and 2.9 _____

7. Find the value of the following:

- a. 2^3 _____
- b. $\sqrt{36}$ _____

8. Round:

- a. 35.6754 to two decimal places _____
- b. 425.8 to the nearest tens _____

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

a. $4,209 \times 63$

240,000	420,000	24,000
---------	---------	--------

b. $60,000 \div 28$

200	2,000	20,000	4,000
-----	-------	--------	-------

Addition, Subtraction, Multiplication, Division

10. Add:

a. \$2, \$21.45 and \$8.23 _____

b. 18.32, 471.019 and 315 _____

11. Subtract:

a. $5,218 - 1,784$ = _____

b. $43.18 - 29.461$ = _____

12. Multiply:

a. 6.87 by 10 _____

b. 13.8 by 3 _____

c. 46.2 by 8 _____

13. Divide:

a. 3.45 by 10 _____

b. 3,024 by 4 _____

c. 56.2 by 0.2 _____

14. Circle the correct answer to $18.642 \div 0.02$:

a. 9.321

b. 93.21

c. 0.9321

d. 932.1

Fractions

15. What fraction is halfway between $\frac{1}{4}$ and $\frac{3}{4}$? _____

16. Add the following:

a. $\frac{1}{4}$ and $\frac{1}{2}$ _____

b. $\frac{2}{3}$ and $\frac{5}{6}$ _____

c. $3\frac{1}{4}$ and $\frac{1}{8}$ _____

17. Calculate:

a. $\frac{5}{6} - \frac{1}{4}$ _____

b. $\frac{21}{14} - \frac{4}{7}$ _____

18. Express as a fraction in lowest terms:

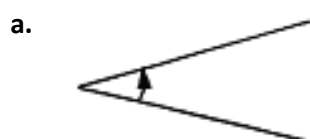
a. 0.75 _____

b. 2.6 _____

c. 30% _____

Geometry

19. Estimate the size of the following angles by selecting the appropriate answers from the list below. Circle the correct response.



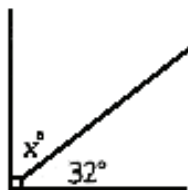
- i. 30°
- ii. 80°
- iii. 120°



- i. 30°
- ii. 80°
- iii. 120°

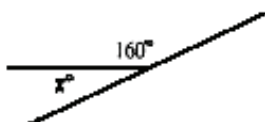
20. Find the value of x° in the following diagrams:

a.



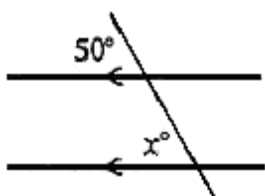
$x =$ _____

b.



$x =$ _____

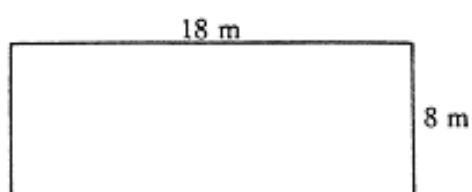
c.



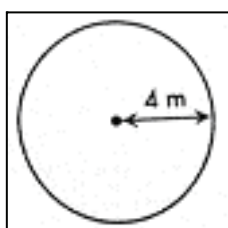
$x =$ _____

Perimeter

21. Find the perimeter of this rectangle.

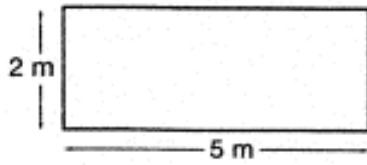


22. Find the circumference of this circle to one decimal place? (Use $\pi = 3.14$)

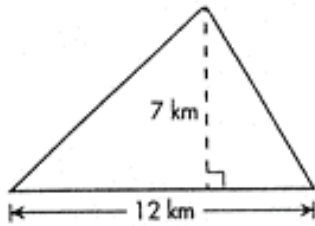


Area

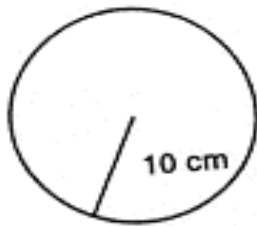
23. What is the area of the rectangle?



24. Find the area of the triangle.

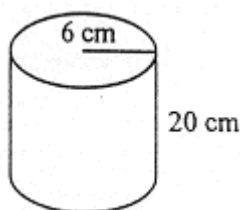


25. Find the area of this circle to one decimal place. (Use $\pi \approx 3.14$)



Volume

26. An oil can in the shape of a cylinder has a radius of 6 cm and a height of 20 cm. What is the volume of the can? (Use $\pi \approx 3.14$)



Percentages

27. Evaluate the following:

a. 10% of \$44 _____

b. 25% of 12.84 _____

28. Christos scored 80% in his automotive exam. There were 25 questions.

a. How many questions did Christos get right? _____

b. How many questions did Christos get wrong? _____

29. Michelle, a spare parts interpreter for GTA Automotive, earns \$960 a week. She gets a pay rise of 5%. What is her new weekly wage?

30. A new 4 cylinder automatic car costs \$16,000. The price was reduced by 10%. Find:

a. The amount the car was reduced by? _____

b. The new cost of the car? _____

31. The price of one tyre is \$120. Jamie gets 10% discount for paying cash. How much did Jamie pay for four tyres with the discount?

Problem Solving

32. Four workers each produced the following number of oil filters on a particular day: 108, 143, 127. What is the total number of oil filters produced that day?

33. A bolt assembly for a car's rear spring consists of a bolt of mass 8.34 g, a washer with mass 1.72 g, a lock washer with mass 0.8 g and a hexagonal nut with mass 2.3 g. What is the total weight of this bolt assembly?

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

35. Two numbers add up to 40. Find the other number if one is 15?

36. After work, you and your four co-workers share a meal and split the costs evenly. If the bill totalled \$168, how much did each person have to pay?

37. Peta the mechanic is paid \$22.00 per hour plus overtime at time and a half (or one and a half times the normal pay rate) for any hours over 35 hours. If she worked 42 hours, calculate:

a. The first 35 hours of work only.

b. The overtime pay only.

c. the total pay.

38. Daniel is a mechanic and he uses feeler gauges to set or measure gaps between two components in a car, for instance when checking spark plugs, doing a valve adjustment, or setting the distributor.

He has six different size feeler gauges: 0.015mm, 0.02mm, 0.04mm, 0.08mm, 0.12mm and 0.15mm.

What combination of gauges would he use to check the size of the following gaps?

a. 0.2mm

b. 0.095mm

Formulae

39. Robert drove 300 km in 6 hours. Calculate his average speed given that speed = distance divided by time.

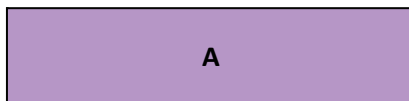
40. If Pressure = Force/Area, find the Pressure if Force = 60 and Area = 20.

41. If $\text{Pressure} = \text{Force} / \text{Area}$, make Force the subject of the formula.

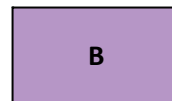
Ratio

42. A 5 litre V8 vehicle uses unleaded petrol in the ratio of 3:1 when compared with a 4 cylinder 1.2 litre vehicle. If there was 24 litres of unleaded petrol in a drum to be shared between the two vehicles, how much would you pump out for the V8 vehicle to use?

43. The length of a truck's tray top in Picture A = 5m. The length of a utility's tray in Picture B = 2m. What is the ratio of the trucks tray top to that of the utility's, in simplest terms?



5m



2m

44. An angle grinder cuts through 0.5cm of steel in 1 minute. How long will it take to make a cut 3.5cm deep?

45. A car travels at a constant speed. If the car takes 30 minutes to travel 50 kilometres, how many kilometres will it travel in 1 hour?

46. A car uses 12 litres of petrol per 100 kilometres. If the tank holds 60 litres, how far will it travel on a full tank?

47. The capacity (volume) of a 6 cylinder car is 2.4 litres. What is the volume of each cylinder?

48. A cars engine crankshaft revolves 2,400 times each minute. How many seconds does it take to revolve 1,200 times?

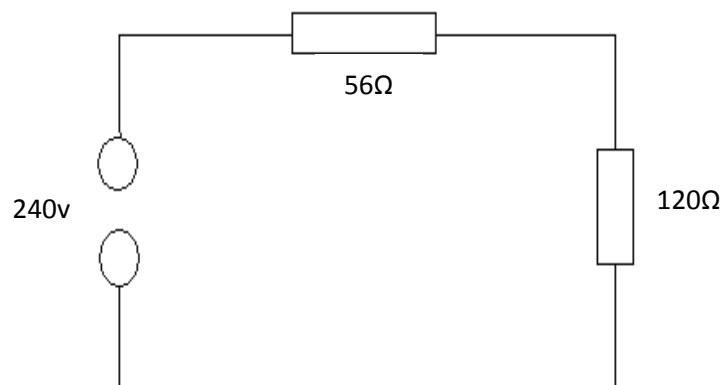
49. Ali's car uses 10 litres of petrol every 300 kilometres. What is the rate of petrol consumption in km per litre for Ali's car?

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

51. A mechanic cut two 14am long pieces of rubber tubing from a tube 50cm long. How much of the original rubber was left?

52. 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 gears in lowest terms?

53. A simple series circuit has two resistors, one 56 ohms and the other is 120ohms and is connected to a supply voltage of 240 volts. Answer the questions on the following page.



QUIZ

Note:

P	=	Power
I	=	Current
R	=	Resistance
V	=	Voltage

- a. Calculate the current flowing (in amps) in the circuit using the formula $V=IR$. Correct to 3 decimal places.

- b. Calculate the total power (in watts) dissipated using the formula $P=I^2R$. For 'I', use the answer you calculated in the previous question. Correct to 2 decimal places.

Section 1 - Literacy, Reading & Comprehension

1. Alternator, Bonnet, Cam gear, Cam shaft, Cam timing belt, Piston, Rocker cover, Sump, Timing cover, Valve
2. a. Mechanics b. Women c. Branches d. Children e. Sheep
3. a. dynamometer b. vacuum c. differential
4. files, solely, individual, whom, recipient, recipient, dissemination, communication, prohibited, unlawful
5. maintenance, schedules, replacement, worn, attention.
6. a. The airbag module; the ECU (Engine Control Unit) which controls the engine functions, the driver's door module; climate control module; cruise control module; the transmission controller which controls automatic transmission ,and ABS module controls the anti-lock brakes and may handle the traction-control and stability-control systems.
 b.
 - The need for sophisticated engine controls to meet emissions and fuel-economy standards.
 - Advanced engine diagnostics and repair.
 - Reduction of the amount of wiring in cars.
 - New safety features.
 - New comfort and convenience features.
 - New entertainment and communication features.
 c. The micro processor that is the most important is the ECU (Engine Control Unit). It controls engine functions like the spark timing and obtaining the correct fuel to air mixture to intake into the engine block. It can also manage the emissions and the fuel economy of the car.
7. a. iii. b. ii. c. iv. d. iv.
8. a. Leather apron, Leather gloves, Welding mask
 b. Overalls, Gloves
 c. Wear steel capped boots
 d. Respirator, Ear muffs or ear plugs
9. a. Face shield, Ear muffs or ear plugs, Gloves
 b. Overalls, Gloves (heavy weight)
 c. Overalls, Gloves (light weight), Respirator, Safety glasses
10. a. Open stairwell b. Permanent railings, chain access, warning markers

Section 2 - General Knowledge

1. a. sump b. cylinder block c. alternator d. fuel injector
 e. piston f. carburettor g. rocker cover h. spark plugs
2. a. Open ended spanner b. Vice grips c. Needle nose pliers
 d. Centre punch e. Phillips head screwdriver f. Micrometer
 g. Tin snips h. Hacksaw
3. a. bumper bar b. windscreen c. boot d. wing mirror
 e. door f. skirt g. bonnet h. wiper arm
4. Volt, current, ohms, diode, resistor

Section 3 - Mathematics

1. a. m
e. m^2 b. min
f. km/hr c. °C
g. ml d. kg
h. \$
2. a. 48.8cm b. 177.4cm
3. a. 25%
f. 35° b. 16.37 c. $\frac{3}{8}$ d. 2% e. 5:4
4. a. 8000m b. 3500g
5. 82.3, 8.23, 0.823
6. a. 0.7 b. 2.85
7. a. 8 b. 6
8. a. 35.68 b. 430
9. a. 240,000 b. 2,000
10. a. \$31.68 b. 804.339
11. a. 3434 b. 13.719
12. a. 68.7 b. 41.4 c. 369.6
13. a. 0.345 b. 756 c. 281
14. d. 932.1
15. $\frac{2}{4}$ or $\frac{1}{2}$
16. a. $\frac{3}{4}$ b. $\frac{9}{6}$ or $1\frac{1}{2}$ or $1\frac{3}{6}$ c. $3\frac{3}{8}$
17. a. $\frac{7}{12}$ b. $\frac{13}{14}$
18. a. $\frac{3}{4}$ b. $\frac{26}{10} = \frac{13}{5}$ c. $\frac{30}{100} = \frac{3}{10}$
19. i. 30° ii. 120°
20. a. 58° b. 20° c. 50°
21. 52m
22. 25.12m
23. $10m^2$
24. $42km^2$
25. $314cm^2$
26. $2,260.8cm^3$
27. a. \$4.40 b. 3.21

QUIZ

28. a. 20 b. 5
29. \$1008.00
30. a. \$1,600 b. \$14,400
31. \$432
32. 1512
33. 13.16g
34. 54g
35. 25
36. \$33.60
37. a. \$770 b. \$231 c. \$1001
38. a. 0.08mm and 0.12mm b. 0.08mm and 0.015mm
39. 50 km/hr
40. $P = 3$
41. $F = P \times A$
42. 18 litres
43. 2.5:1
44. 7 minutes
45. 100km
46. 500km
47. 0.4litres
48. 30 seconds
49. 30km/l
50. 19200m³
51. 22cm
52. 4:5
53. a. 1.364 amps b. 327.45 W

Contributions

This Practice Aptitude Quiz would not have been possible without the support of the State Government of South Australia, Group Training Australia (SA) Inc and its members.

This Practice Aptitude Quiz was developed by:



Group Training South Australia - www.gtasa.com.au

Group Training Australia (SA) (GTA SA) is a network of independent not for profit organisations located in metropolitan Adelaide and all major population centres throughout the state. These organisations operate on either an industry or regional basis and collectively they provide employment for in excess of 4,000 apprentices and trainees.

GTA SA members are:

AFL SportsReady - www.aflsportsready.com.au

ATEC Group Training - www.atec.asn.au

Australian Industry Group Training Services - www.aigts.com.au

Career Employment Group - www.ceg.net.au

Group Training Employment - www.gte.org.au

Hospitality Group Training - www.hospitalitysa.com.au

Maxima Group Training - www.maxima.com.au

Motor Trade Association Group Training Scheme - www.mtagts.asn.au

Murraylands Training & Employment Association of SA Inc - www.mteasa.com.au

PEER VEET - www.peer.com.au

Plumbing Industry Association Group Training - www.piasa.com.au

SMGT Total Employment Solutions - www.smgt.com.au

Statewide Group Training - Torrensville - www.statewideapprenticeships.com.au

Trainee and Apprentice Training Service Inc (TAPS) - www.tapssa.com.au

With specific thanks to:



Motor Trade Association Group Training Scheme - www.mtagts.asn.au

The Motor Trade Association employs over 520 automotive apprentices making it Australia's largest automotive industry Group Training Scheme. MTA-GTS also operates as a registered training provider delivering Certificate I, II and III automotive training across a number of automotive trades. MTA-GTS is located at Royal Park, employing apprentices/trainees in various retail motor industry trades. MTA-GTS commenced operation in September 1982 with a group of 10 motor mechanic apprentices. Since these humble beginnings more than 2000 apprentices have graduated to full time employment as skilled, qualified tradespeople.



QUIZ

Maxima Training - www.maxima.com.au

Maxima is known as a national leader valued by individuals, organisations and communities for helping people develop their skills and potential to find jobs.

Maxima is a Registered Training Organisation that has built a reputation for providing creative training solutions. They provide training in [Business, Management and Project Management](#); [Horticulture](#); [Conservation and Land Management](#); [Retail](#); Transport and Logistics; and [Local Government](#).



Australian Apprenticeships Pathways Website - www.aapathways.com.au

This website, part of the Australian Apprenticeships and Traineeships Information Service, provides sample Australian Apprenticeships job descriptions and links to more Australian Apprenticeships information and resources. The service is funded by the Department of Education, Employment and Workplace Relations.



Manufacturing Skills Australia - www.mskills.com.au

Manufacturing Skills Australia (MSA) is one of 11 Industry Skills Councils funded by the Australian Government to support skills development. MSA is addressing the skills needs of over 250,000 manufacturing and other businesses employing over 1.1 million Australians. MSA represents a range of industry sectors, including Metal and Engineering, Manufacturing, Aerospace, Chemicals, Hydrocarbons & Refining, Plastics, Rubber and Cablemaking, Laboratory Operations, Manufactured Mineral Products, Furnishing; and Textiles, Clothing and Footwear.



The Career Education Association of Victoria - www.ceav.vic.edu.au

The CEAV is the Victorian peak body for secondary school career practitioners, work experience coordinators, VET coordinators and MIPS coordinators. The CEAV provides professional development opportunities for members and also works with business, industry, and the education and training sector.



Industry Training Australia P/L - www.itaust.com.au

Industry Training Australia (ITA) delivers consultancy services to government and non-government organisations in the education and training sector. ITA develops and delivers information and communication services, including the Australian Apprenticeships Pathways website, for service provider networks and the general public.

For enquiries about this Practice Aptitude Quiz contact the Australian Apprenticeships and Traineeships Information Service on 1800 338 022.