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## Part 1: About this Building \& Construction

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 Building and Construction.

## 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 focuses on literacy, numeracy, comprehension and problem solving questions contextualised to this specific industry.

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;
> Used by teachers as a guide to industry math requirements at the entry point of this particular Australian Apprenticeship career path;
> Used by teachers as classroom based activities for students in Years 10 to 12 and Vocational Education and Training centred studies.

The quiz should be able to be completed in approximately 1 hour and 20 minutes.
Please note that rates quoted in this for various items, including pay rates, are not meant to reflect today's values, they are used purely for mathematical purposes.

Calculators may be used to complete this practice exercise.
Answers are located at the end of the quiz.

Building \& Construction Career, Occupational Information and Job Hunting Resources
Information and links on the Building \& Construction industry, careers, job prospects as well as career websites and job hunting resources can be found at www.aapathways.com.au/Career-Resources.

## 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/aac 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/default.aspx

## Part 2: The quiz

## Section 1 - Literacy, Reading and Comprehension

## Spelling

1. The following text has $\mathbf{1 2}$ spelling errors in it. List those errors with the correct spelling in the order you find them in the text.

Today the Construction, Plumbing and Services Industry is worth over $\$ 50$ bilion and employs over three quarters of a million people. The industry is divided into three sectors: domestic; comercial; and civil. The magority of workers are ether aprentices/trainees, construction workers or tradspersons. There are over 20 trades ranging from concrite and steal workers to telecomunication technicians. There are many carreer pathways and oportunities available to prospective employes willing to apply themselves.

2. Write the correct spelling for the following words
a. Elemination
b. Prefabrikated $\qquad$
c. Demolishon $\qquad$
d. Certifikate $\qquad$
e. Sprinklar
f. Briklaying
g. Vocationl $\qquad$
h. Permision $\qquad$
i. Comitees $\qquad$
j. Partisipate

## Comprehension

3. Read the following passage and answer the questions that follow.

The purpose of the construction industry is to erect structures, from simple house structures to major multi-storey civil and commercial structures. A construction project begins with an idea and ends with the completion of the final structure. From beginning to end there are several stages and each stage has its own series of steps. In order for each stage of the project to be completed successfully effective communication is vital.

Communication can only be considered successful when the receiver of the information understands exactly what the sender of the information intended. Feedback from the receiver of the information to the sender of the information can determine if the communication was successful. Workplace communication is how we convey or share information in the workplace. People use a wide variety of ways to communicate with each other. Sometimes these are used alone or combined together to make a message or information clearer. Methods of communication include verbal, written, electronic and non-verbal. When communicating you must be accurate, clear, concise, comprehensive and logical.
a. What is the main purpose of the construction industry?
$\qquad$
$\qquad$
$\qquad$
$\qquad$
b. What is a vital tool or skill that is used in the building and construction industry to ensure a project is completed successfully?
$\qquad$
$\qquad$
$\qquad$
$\qquad$
c. Explain how you would know if someone had understood an instruction you gave them.
$\qquad$
$\qquad$
$\qquad$
$\qquad$
d. List three different examples of ways to exchange information.
$\qquad$
$\qquad$
$\qquad$
$\qquad$
e. Do you think effective communication is important in the building and construction industry? Why?
$\qquad$
$\qquad$
$\qquad$
$\qquad$

## General Knowledge

4. What tool is that?

Match the tool names to the pictures of the tools.
A)


$$
1
$$

B)

C)

5. Read the following about Personal Protective Equipment (PPE) and then answer the questions that follow.

In the Building and Construction Industry personal protective clothing, overalls, hand protection and foot protection are often necessary. Respiratory protective equipment may be required when dangerous gases and dusts are present. Personal Protective Equipment (PPE) includes clothing, equipment and substances designed to be worn by a person to protect them from risks of injury or disease.

PPE is only to be used in the workplace where it is not reasonably practicable to control hazards by other means.

The following information describes some PPE and signs used to guard workers against specific hazards.


Photo A


Photo B

Sign A



Sign B


Sign C

Goggles


Photo C


Sign D

| Part of Body | Some Potential Hazards |
| :--- | :--- |
| Head | Falling objects. |
| Face \& Eyes | Sparks, ultraviolet light, metal shards, chemical splashes, fumes, <br> and wood splinters. |
| Hearing: | Excessive noise. |
| Respiratory: | Dust, fumes, vapours, wood shavings, and sawdust. |
| Hands: | Abrasion, sparks, irritant substances, vibration, electric shock, and <br> wood splinters. |
| Feet: | Crushing, slipping, abrasion, irritant substances, wetness, electric <br> shock, static electricity, puncture, and cold/heat. |

## Questions:

a. Using a hammer drill can produce sparks that have the potential to damage eyes. What PPE or signs could be used to guard against this hazard? Write the photo and/or sign title below. (Note: there may be more than one answer in this case).
b. If you are lifting heavy objects there is a risk of dropping the load on your feet. What PPE or sign could be used to minimise this risk? Write the photo and/or sign title below.
c. Some machinery operates at high noise levels. What PPE or sign could be used to help protect worker's hearing in these types of situations? Write the photo and/or sign title below.

## Section 2 - Mathematics

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

1. Match the abbreviations to the correct unit of measurement which they represent. Write your answers in the table below.

| kg | ml | $\mathrm{km} / \mathrm{hr}$ | $\mathrm{m}^{2}$ |
| :--- | :--- | :--- | :--- |
| $\$$ | m | min | ${ }^{\circ} \mathrm{C}$ |


| length |  |
| :--- | :--- |
| time |  |
| temperature |  |
| weight |  |
| area |  |
| speed |  |
| volume |  |
| cost |  |

2. Match the numbers to their descriptions. Write your answers in the table below.
$3 / 8$
$35^{\circ}$
25\%
5:4
16.37
$21 / 3$

| percentage |  |
| :--- | :--- |
| decimal number |  |
| fraction |  |
| mixed number |  |
| ratio |  |
| angle |  |

3. Write as a number:
a. Two thousand six hundred and thirty four $\qquad$
b. Fifty six thousand and eighty seven.
4. Round:
a. $\quad 35.6754$ to two decimal places $\qquad$
b. 425.8 to the nearest ten $\qquad$
c. 248 to the nearest hundred $\qquad$
5. Estimations

Write your estimations for the following.

| height of a standard door (use m or mm ) |  |
| :--- | :--- |
| length and width of A4 sized paper (use cm ) |  |
| angle between the floor and wall (use degrees) |  |
| floor area of a single car garage (use $\mathrm{m}^{2}$ ) |  |

6. Write the following decimals in descending order.
7.19
71.9
0.719
$\qquad$
$\qquad$
$\qquad$

## Operations

(Addition, Subtraction, Division, Multiplication)

## 7. Solve the following equations:

a. $\quad 2+3 \times 4$
$=$
b. $4-10 \div 2$
c. $\quad 50+50$ $\qquad$
d. $2 \times 25$ $\qquad$
e. $(16-5) \times 3$ $\qquad$
f. $(75 \div 5) \div(12 \div 4)$ $\qquad$
g. $\quad 8^{2}$ $\qquad$
h. $\sqrt{25}$ $\qquad$
8. Subtract:
a. 1,784 from 5,218
b. $\quad 29.461$ from 43.18
9. Find the total of:
a. $\$ 2.00, \$ 21.45$ and $\$ 8.23$ $\qquad$
b. $\quad 18.32,471.019$ and 315 $\qquad$
c. $\quad 2.63 \mathrm{~m}$ and 50 cm $\qquad$
10. Multiply:
a. $\quad 6.87$ by 10 $\qquad$
b. $\quad 13.8$ by 3 $\qquad$
c. $\quad 46.2$ by 8.5 $\qquad$
11. Divide:
a. $\quad 3.45$ by 10 $\qquad$
b. 3024 by 14 $\qquad$
c. $\quad 56.2$ by 0.2 $\qquad$
12. Select the best estimate for each of the following. (Circle the correct answer)
a. $\quad 4,249 \times 71$
$280,000 \quad 150,000 \quad 28,000$
b. $\mathbf{8 0 , 0 0 0} \div 38$
$200 \quad 2,000 \quad 20,000 \quad 4,000$

## Fractions

13. Add the following:
a. $\quad 1 / 4$ and $1 / 2$
b. $\quad 2 / 9$ and $5 / 6$
c. $\quad 31 / 4$ and $1 / 8$
14. Subtract the following:
a. $5 / 6-1 / 4$
b. $21 / 14-4 / 7$
15. Which fraction is mid-way between $1 / 4$ and $3 / 4$ ?
$\qquad$

## Percentages

16. Evaluate the following:
a. $10 \%$ of $\$ 44$
b. $25 \%$ of 12.84
17. Michelle earns $\$ 800$ a week. She gets a pay rise of $5 \%$. What is her new wage?
$\qquad$
18. Mal purchased a belt sander for $\boldsymbol{\$} \mathbf{2 5 0}$ which he later sold for $\boldsymbol{\$ 3 7 5}$.
a. How much profit did he make?
b. What was the profit as a percentage of the cost price?
19. Rebecca is a painter who buys the following items from a paint store:

Paint $\mathbf{\$ 2 1 5 ; ~ r o l l e r s ~ a n d ~ b r u s h e s ~ \$ 9 5 ; ~ c l e a n i n g ~ f l u i d s ~ \$ 1 2 ; ~ a n d ~ p l a s t i c ~ c o v e r s ~ \$ 8 . ~}$
Rebecca gets a 10\% trade discount.
a. How much would Rebecca pay without the discount?
b. How much will she pay with the discount?
$\qquad$
c. How much has Rebecca saved?
$\qquad$
20. Akeem scored $\mathbf{8 0 \%}$ in an exam. There were $\mathbf{2 5}$ questions.
a. How many questions did he get right? $\qquad$
b. How many questions did Akeem get wrong?

## Decimals

21. Find the decimal number halfway between:
a. $\quad 0.6$ and 0.8
b. $\quad 2.8$ and 2.9
22. If a plastic pipe costs $\$ 8.00$ a metre, how many complete metres of pipe could be bought for $\$ 60.00$ ?
$\qquad$
23. Camillo bought Christmas lunch for his four employees. The cost was $\boldsymbol{\$ 1 4 8 . 6 0}$.
a. If the cost of the lunch had been divided equally among the five people, how much would each have paid?
$\qquad$
b. If Camillo had purchased the lunch using a voucher giving a $40 \%$ discount, how much would have the lunch cost him?
$\qquad$
24. Phil is a plasterer and earns $\boldsymbol{\$ 2 8 . 0 0}$ an hour for a normal 40 hour week. For any overtime, that is hours worked over the standard 40 hour week, he receives a pay rate of 'time-and-a-half' or one and a half times the normal pay rate.

What is Phil's total pay if he works 42 hours this week?
$\qquad$
,

## Geometry

25. Estimate the size of the following angles by selecting the appropriate answers from the list below. (Circle the correct answer).
a.

i. $30^{\circ}$
ii. $\quad 110^{\circ}$
iii. $170^{\circ}$
b.

26. Find the value of $x^{\circ}$ in the following:
a.

$x=$ $\qquad$

$x=$ $\qquad$
b.

## Shapes

27. Match the description of shapes in the table to the pictures below. Write your answer in the table.

| i. $\quad$ circle |  |  |
| :--- | :--- | :--- |
| ii. $\quad$ triangle |  |  |
| iii. $\quad$ rectangle |  |  |
| iv. | square |  |
| v. | semicircle |  |
| vi. | parallel lines |  |
| vii. | cross |  |
| viii. | star |  |
| ix. | cube |  |
| x. | cylinder |  |
| xi. | diagonal |  |
| xii. | right angle |  |
| xiii. | revolution |  |
| xiv. | right angled triangle |  |
| xv. | straight angle |  |
| xvi. | circle and diameter |  |
| xvii. | circle and radius |  |



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28. Find the perimeter of these shapes.
a.

b.

29. If each square represents 1 square centimeter, what is the area of the shape shown?

30. A bricklayer estimates there are 55 bricks to the square metre. How many bricks are needed for a 6 square metre wall?
$\qquad$
31. a. A circular flowerbed with a radius of 3 metres is to be surrounded by a concrete path 1 metre wide. Calculate the area of the path, where $\pi=3.14$.
b. A quote to supply and lay the concrete for this path is $\boldsymbol{\$ 1 0}$ per square metre. What is the cost of the path?
32. An oil can in the shape of a cylinder has a radius of $\mathbf{6 m}$ and a height of 20 cm . What is the volume of the can? (Use $\pi=3.14$ )
$\qquad$
33. Dirk is going to paint the ceiling in his lounge room. The room measures 6 metres by 3 metres. One litre of ceiling paint covers 12 square metres.
a. What is the area of the ceiling?
b. How many litres of paint will he use?
34. What is the area of these shapes?
a.

b.

35. Calculate the area of this circle? Use the formula $A=\pi r^{2}$ Where $\pi=3.14$.

$\qquad$
36. If each cube represents 1 cubic centimetre, what is the total volume of the shape shown?

37. Calculate the volume of the cylinder using the formula $V=\pi r^{2} h$ Where $\pi=3.14$.

38. If the volume of this box is $\mathbf{2 4}$ cubic metres, how high are the sides?

$\qquad$

## Pythagorus

39. Calculate the pitch line length of one side of the gable roof?

40. A wooden gate 800 mm wide and 1200 mm high needs a diagonal brace for support. How long will the brace be?


## Ratio

41. A ready-mix concrete company uses metal, sand and cement in the ratio of 7:5:3. What amount of cement is needed for a $15 \mathbf{~ m}^{\mathbf{3}}$ job?
$\qquad$
42. If the scale on a drawing is $1: 100$, what length will be represented on the drawing by a measurement of $\mathbf{8 0} \mathbf{~ m m}$ ?
$\qquad$
43. What is the ratio of the number of circles to squares?


44. Adam always mixes 8 shovels of sand with 10 shovels of metal when he makes concrete. How many shovels of sand will Adam mix with 50 shovels of metal?
$\qquad$

## Problem Solving

45. Calculate the cost of $\mathbf{4 0}$ hinges at $\mathbf{\$ 3 . 0 0}$ a pair?
$\qquad$
46. If five litres of glue costs $\boldsymbol{\$} \mathbf{6 5 . 0 0}$, how much will 1 litre cost?
$\qquad$
47. Carla, a 3rd year apprentice, is paid a yearly salary of $\mathbf{\$ 3 1 , 2 0 0}$. Calculate her:
a. Monthly salary
b. Fortnightly salary
$\qquad$
$\qquad$
48. Peter the carpenter is paid $\mathbf{\$ 2 6 . 0 0}$ per hour plus time and a half for any hours over 35 hours per week. If he worked 42 hours last week, what was his pay for:
a. The first 35 hours work?
b. The overtime work only? $\qquad$
c. Total pay?
49. Eamon's car uses $\mathbf{1 0}$ litres of petrol every $\mathbf{3 0 0}$ kilometres. What is its rate of petrol consumption in km per litre?
50. If a 3,600 litre water tank is $1 / 4$ full:
a. How much water is in the tank?
b. How much is empty space?
51. Simon is a bricklayer. He uses 50 bricks to build a 1 square metre wall. How many bricks are needed to build a wall that measures 6 metres by 3 metres?
$\qquad$
52. Gerry is a carpenter making a bookcase. She hit a nail 65 mm long through a piece of wood $\mathbf{2 2 . 5}$ mm thick and into a large piece of wood. How far did the nail go into the large piece of wood?

## Section 1 - Literacy, Reading \& Comprehension

1. billion, commercial, majority, either, apprentices, tradespersons, concrete, steel, telecommunication, career, opportunities, employees
2. Elimination, Prefabricated, Demolition, Certificate, Sprinkler, Bricklaying, Vocational, Permission, Committees, Participate
3. a. The main purpose of the industry is to erect structures. These structures could range from simple house structures to major multistorey civil and commercial structures.
b. Effective communication is vital in order for each stage of the building project to be completed successfully.
c. You can tell if someone has understood the instruction you gave them from the feedback the receiver gives you.
d. Verbal: speaking to each other, Written: leaving a note, Electronic: sending an email, or Non-verbal: body language (nodding head).
e. Yes, it's very important. There are so many stages between the commencement of a structure to the completion. Several tradespeople are involved and are often relying on work to be completed before they can start theirs. If there is a break down in communication, stages can become delayed, structures aren't built properly, the building of the structures might have to start again and generally time and resources are wasted. Break down of communication can become very costly as well!
4. $E, A, B, C, F, D$.
5. a. Photo $C$ and Sign $C$ b. Sign B c. Sign D

## Section 2 - Mathematics

1. $\mathrm{m}, \mathrm{min},{ }^{\circ} \mathrm{C}, \mathrm{kg}, \mathrm{m}^{2}, \mathrm{~km} / \mathrm{hr}, \mathrm{ml}, \$$
2. $25 \%, 16.37,{ }^{3} / 8,2 \frac{1}{3}, 5: 4,35^{\circ}$
3. a. 2,634
b. 56,087
4. a. 35.68
b. 430
c. 200
5. a. 2 m or 2000 mm
b. $\quad 30 \mathrm{~cm}$ by 20 cm
c. $\quad 90^{\circ}$
d. $\quad 6 \mathrm{~m} \times 3 \mathrm{~m}=18 \mathrm{~m}^{2}$
6. $71.9,7.19,0.719$
7. a. 14
f. 5
8. a. 3,434
-1
g. 64
b. $\quad 13.719$
9. a. $\$ 31.68$
b. $\quad 804.339$
c. $\quad 3.13 \mathrm{~m}$ or 313 cm
10. a. 68.7
b. $\quad 41.4$
c. $\quad 392.7$
11. a. 0.345
b. 216
c. 281
12. a. 280,000
b. 2,000
13. a. $3 / 4$
b. $\quad 19 / 18$ or $1 \frac{1}{18}$
c. $\quad 27 / 8$ or $33 / 8$
14. a. $\quad 7 / 12$
b. $\quad 13 / 14$
15. $1 / 2$ or ${ }^{2} / 4$
16. a. $\$ 4.40$
b. $\quad 3.21$
17. $\$ 840$
18. 

a. $\quad \$ 125$
b. $50 \%$
19. a. $\$ 330$
b. $\quad \$ 297$
c. $\$ 33$
20. a. 20
b. 5
21. a. 0.7
b. $\quad 2.85$
22. 7
23. a. $\$ 29.72$
b. $\quad \$ 89.16$
24. $\$ 1204.00$
25. a. i. $30^{\circ}$
b. ii. $110^{\circ}$
26. a. $44^{\circ}$
b. $150^{\circ}$

27
7. K
ii. G
iii. $P$
iv. J
v. C
vi. $L$
vii. B
viii. Q
ix. A
x. 1
xi. $M$
xii. D
xiii. 0
xiv. H
xv. F
xvi. E
28. a. $36,000 \mathrm{~mm}$
b. $40,000 \mathrm{~mm}$
29. $14 \mathrm{~cm}^{2}$
30. 330 bricks
31. a. $\quad 21.98 \mathrm{~m}^{2}$
b. $\quad \$ 219.80$
32. $2,260.8 \mathrm{~cm}^{3}$
33. a. $18 \mathrm{~m}^{2}$
b. $\quad 1.5$ litres
34. a. $8 \mathrm{~m}^{2}$
b. $\quad 40 \mathrm{~m}^{2}$
35. $314 \mathrm{~m}^{2}$
36. $6 \mathrm{~cm}^{3}$
37. $628 \mathrm{~m}^{3}$
38. 3 m
39. 5 m
40. 1442.22 mm
41. $3 \mathrm{~m}^{3}$
42. $8,000 \mathrm{~mm}$ or 8 m
43. $3: 2$
44. 40
45. $\$ 60$
46. $\$ 13.00$
47. a. $\$ 2,600$
b. $\$ 1,200$
48. a. $\$ 910$
b. $\$ 273$
c. $\$ 1,183$
49. $30 \mathrm{~km} / \mathrm{l}$
50. a. 900 litres b. 2,700 litres
51. 900 bricks
52. 42.5 mm

## 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:

## २GTA

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
$>\quad$ 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
$>\quad$ Murraylands Training \& Employment Association of SA Inc - www.mteasa.com.au
$>\quad$ PEER VEET - www.peer.com.au
$>\quad$ Plumbing Industry Association Group Training - www.piasa.com.au
> SMGT Total Employment Solutions - www.smgt.com.au
$>\quad$ Statewide Group Training - Torrensville - www.statewidegrouptraining.com.au
> Trainee and Apprentice Training Service Inc (TAPS) - www.tapssa.com.au
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## With specific thanks to:



## Statewide <br> GROUP TRAINING SA

Statewide Group Training - www.statewidegrouptraining.com.au.
Statewide Group Training is an independent, community-based not for profit organisation that has been operating successfully since 1988. Statewide is one of the largest employers of Apprentices and Trainees in South Australia. Currently employing approximately 400 young people in a wide variety of industries, Statewide Group Training is an Equal Opportunity Employer that covers vocations for both
Apprenticeships and Traineeships.

## apprentices <br> best in the business

Housing Industry Association - www.hia.com.au
One of the greatest challenges our industry faces is the shortage of trade skills. HIA Apprentices was formed more than 20 years ago to address this issue; to help young people into apprenticeships and make it easier for builders and contractors to take them on. As a result of the ongoing training and mentoring provided by HIA Members and HIA Apprentices staff, thousands of young people have become highly skilled and successful tradespeople in great demand.

Australian Apprenticeships Pathways Website - www.aapathways.com.au
This website provides sample Australian Apprenticeships job descriptions and links to more Australian Apprenticeships information and resources. The site is funded by the Department of Industry.


Construction and Property Services Industry Skills Council - www.cpsisc.com.au
Construction and Property Services Industry Skills Council (CPSISC) The CPSISC represents the workforce training and development needs of an extremely large and vitally important sector of the Australian economy - the Construction and Property Services Industries.

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

Industry Training Australia P/L - www.itaust.com.au
Industry Training Australia (ITA) develops and delivers information and communication services, including the Australian Apprenticeships Pathways website, for service provider networks and the general public.

