Practice Aptitude Assessment
for
Plumbing Industry
(Apprentice Plumber)

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Acknowledgements

Guidance

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

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

This assessment is intended to prepare people who may be required to sit an aptitude test as part of an interview and assessment process for a job vacancy, such as an apprenticeship.
The assessment can be used by a number of different organisations or people such as Group Training Organisations, Career Education Teachers, Mathematics Teachers within schools or New Apprenticeship Centres.
The assessment can be:

- provided to individual people to enable them to practice and hone their skills before sitting an actual aptitude test.

- used by Career Education Teachers for individuals or in a class setting to provide general guidance to students on what they may expect during the interview process if they intend commencing a career as an apprentice.

- used by Mathematics Teachers as a guide to Industry mathematics requirements at the entry point of a particular apprenticeship career path.

This practice aptitude assessment has two components; Literacy and Mathematics.

You may find that this assessment differs from similar tests administered by Industry as their tests may have other elements included, that this one does not, such as:

Mechanical Reasoning;
Building and Construction Theory;
Building and Construction Knowledge and reasoning;

The mathematics questions contained within this document are equivalent to Applied Mathematics at the Year 10 level in South Australia.

The test should be able to be completed in approximately 1 hour 20 minutes.

Calculators may not be used to complete this practice assessment, however Industry in some cases does allow calculators to be used in their aptitude tests.

ENGLISH

Spelling

1. <u>The following text has 10 spelling errors in it. Correct those errors and list them in the order you find them in the text.</u>

_____

_____

To become a Plumber usally requires compleshion of a New Apprenticeship in Plumbing, Gasfitting and Draining. Employers genraly require Year 10 with good resolts in English and maths. You may be able to start training for this vocation wile still at school.

_____

_____

The lenth of training can vary and may involve both on-the-job and off-the-job componants. The off-the-job training is provided through Registered Training Organisations to Certificate III level.

_____

_____

Plumbing, Gasfitting and Draining are licensed occupasions, which means that in addition to your formel qualifications, a lisence to work must be obtained by your local Water Board or Gas Company.

_____

_____

_____

2. Write the correct form of the following words

_____

a) Bathroome	f) Plumbing	_____
b) Watra Bored	g) Gassfitting	_____
c) Ocupation	h) Drainning	_____
d) Reciept	i) Coper Pipe	_____
e) Sprinklar	j) Sola Heating	_____

_____

_____

_____

_____

Comprehension – (a)

Installing a bath

To install a bath a knowledge of all relevant by-laws and approved fixing methods is required.

The bath may be placed into position at the "rough" stage (when the building is at the frame stage) or may be left out until the floor, ceiling and walls have been clad. The bath is less likely to be damaged when installed after other trades have completed their work.

If installed at the "rough" stage, other tradesmen must take care not to damage the bath while under construction. It would be your responsibility to see that it was adequately protected.

Plumbers often have to install a bath in an existing home. This is a much more difficult task than in a building under construction because:
- Pipes need to be installed behind existing wall cladding
- The baths flashing and support rim must be in behind the wall cladding – this may require extensive work on the wall.

Usually the builder is responsible for levelling, flashing and securing the bath, but you must check prior to commencing further work that these are correct. The following steps must be followed:

- Secure the bath
- Allow adequate clearance for flashing to ensure a watertight installation
- Level the bath

Note

The builder is responsible for the levelling, provision of flashing and securing the bath, but the plumber must ensure that all are checked prior to commencing any further work in the bath.

With this in mind, a plumber must check the following before commencing the plumbing installation

- The bath is firmly secured into position
- There have been adequate allowances left for flashing
- The bath is level.

QUESTIONS

1a. Why is it better to place the bath in position after the other trades have completed their work?

_____
_____
_____
_____

2a. Usually the builder is responsible for the levelling, provision of flashing and securing of the bath. What steps must the plumber take to ensure that these are correct?

_____
_____
_____
_____

3a. What must you have a knowledge of to install a bath?

_____
_____
_____
_____

4a. Why is it more difficult to install a bath in an existing home?

_____
_____
_____
_____

Comprehension – (b)
Rain water tanks

A rainwater tank that can hold at least one kilolitre of water is mandatory for all new homes built in South Australia from July 1st 2006. The minimum requirements for all new homes and significant home extensions are:

- A minimum of 50m^2 of roof area must be connected to the rainwater tank
- The tank must be connected to at least one toilet, laundry cold water outlets or a hot water supply
- It must include automatic switching between tank and mains water, mosquito control and backflow prevention devices.

A one kilolitre tank attached to a relatively small house, with average water use by family in Adelaide will capture 19 kilolitres a year.

There are two exemptions to the law

- A rainwater tank will not be required in the council areas of Roxby Downs and Cooper Pedy which have low and highly variable rainfall that would provide limited water savings.
- A tank will not be a requirement for homes with a dual supply system plumbed into the house, for example, systems using recycled effluent for toilet flushing.

There are about 440,000 existing dwellings in Adelaide and with only 6,000 – 10,000 new dwellings built in South Australia each year Adelaide could run out of water long before existing homes have rain water tanks plumbed into their laundries and toilets.

Evidence from existing tanks plumbed into homes in Adelaide would suggest that a 1000 litre tank will be rapidly consumed if it does more than flush a toilet or supply laundry over summer.

QUESTIONS

1b. Why is there an exemption to the law if you live in Roxby Downs?

_____
_____
_____
_____

2b. According to the text, are these requirements adequate to prevent Adelaide running out of water? Why?

_____
_____
_____
_____

3b. What must the tank be connected to, to comply with regulations?

_____
_____
_____
_____

4b. What must be included in the tank connection?

_____
_____
_____
_____

MATHEMATICS

Numbers (Scientific Notation, Measurement, Number Values)

1. What unit from the list 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	m²
$	m	min	°C

2. From the list of numbers below, select the one which is a:

    a) percentage _____

    b) decimal number _____

    c) fraction _____

    d) mixed number _____

    e) ratio _____

    f) angle _____

3/8	35°	25%
5:4	16·37	3¼

3. Write as a number:

    a) two thousand six hundred and thirty four _____

    b) fifty six thousand and eighty seven. _____

    _____

    _____

    _____

    _____

4. Convert the following:

    a) $2·41 to cents _____

    b) 182 days to weeks _____

    c) 3 hours and 12 seconds to seconds _____

    d) 8 kilometers to metres _____

    e) 3·5 kilograms to grams _____

5. One day Peter worked 6 hr 35 min and on another day 4 hr 40 min. What was the total time Peter worked?

    _____

    _____

    _____

6. Jane the building clerk started work at 11:30am and finished at 2:10pm. How long did she work for? _____

Arithmetic (Addition, Subtraction, Multiplication, Division)

7. Find the total of:

                    _____

a) $2, $21·45 and $8·23 _____

b) 18·32, 471·019 and 315 _____

c) 2·63m and 50cm

8. Subtract

a) 1,784 from 5,218 _____

b) 29·461 from 43·18 _____

9. Multiply:

(a) 6· 87 by 10 _____

(b) 13 · 8 by 3 _____

(c) 46·2 by 8·5 _____

10. Divide:

(a) 3·45 by 10 _____

(b) 3024 by 14 _____

(c) 56·2 by 0·2 _____

11. Find the value of x from the drawing.

                    _____
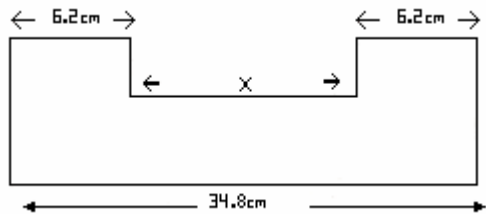
Fractions

12. Which fraction is between ¼ and ¾?

(a) ½	(b) ⅛	(c) ⅞	(d) 3¼

    _____

Percentages

13. Evaluate the following:

(a)   10% of $44 _____

(b)   25% of 12 · 84 _____

14. Which represents the best buy, (a) or (b)?

(a) 3 kg for $4·00 _____

(b) 12 kg for $18·00 _____

Shapes

15. Which shape below best represents a

        (a) circle   _____
        (b) triangle   _____
        (c) rectangle   _____
        (d) square   _____
        (e) semicircle   _____
        (f) parallel lines   _____
        (g) cross   _____
        (h) star   _____
        (i) cube   _____
        (j) cylinder   _____
        (k) diagonal   _____
        (l) right angle   _____
        (m)revolution   _____
        (n) right angled triangle   _____
        (o) straight angle   _____
        (p) circle and diameter   _____
        (q) circle and radius   _____

A   B   C   D   E   F

G   H   I   J   K

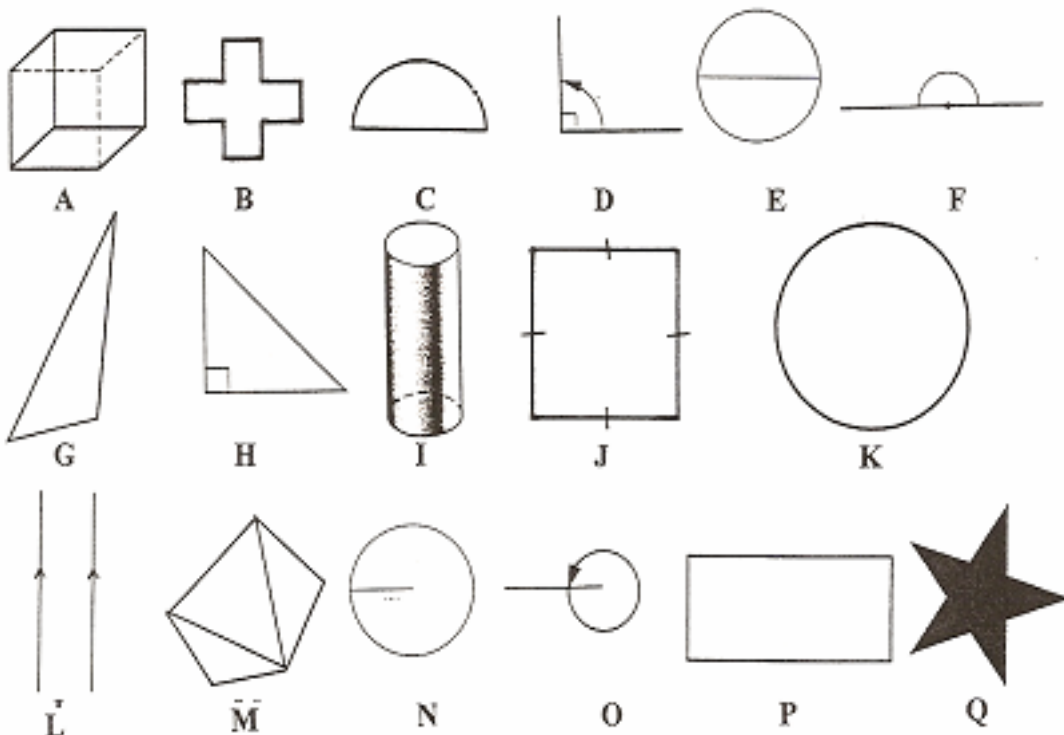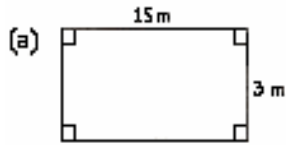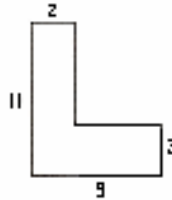L   M   N   O   P   Q

Perimeter, Area

16. A bricklayer estimates there are 55 bricks to the square metre.

How many bricks are needed for a 6 square metres wall? _____

17. Find the perimeter of these shapes.

(a) 15 m, 3 m

(b) 2, 11, 9, 3

_____

_____

Problem Solving

_____

_____

18. If a car is traveling at 60km/hr, how far will it travel in 3 hours? _____

19. Calculate the cost of 40 hinges at $3·00 a pair?

_____

20. What is the average of 12 and 18? _____

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

22. John earns $11·50 per hour for a 40-hour week. Find his weekly wage?

_____

23. If one stepladder costs $98·00, how much would six stepladders cost?

_____

24. Find the missing numbers in the following:

(a) 20   25   30   35   ?   _____

(b) 3   9   27   ?   _____

(c) 4   8   12   16   ?   _____

(d) 10   3   11   ?   12   5   _____

(e) 64   32   16   ?   4   _____

25. Plastic water pipe costs $8·00 a metre. How many complete metres of pipe could I buy for $60·00? _____

26. A dinner bill was divided equally among 6 people. The total of the bill was $48·60.

    (a) How much did each pay? _____

    (b) If Tuesday is half price day, how much will each pay? _____

27. Phil is a plumber and earns $12·00 an hour for a normal 40 hour week. For any overtime, he receives time-and-a-half thereafter. How much does he receive for working 42 hours?

_____

_____

28. Five litres of glue for gluing water pipe costs $65·00. How much will 1 litre cost?

_____

29. Jeff's yearly salary is $31,200. Calculate his:

    (a) monthly salary _____

    (b) fortnightly salary _____

30. Peter the Plumber's Assistant is paid $10·00 per hour plus time and a half for any hours over 35 hours. If he worked 42 hours, what was his pay for

    (a)   the first 35 hours work _____

    (b)   the overtime work only _____

    (c)   total pay? _____

31. My car uses 10 litres of petrol every 300 kilometres. What is the rate of petrol consumption in km per litre?

_____

_____

32. A 3600litre water tank is a ¼ full.

    (a)   How much water is in the tank? _____

    (b)   How much is empty space? _____

ANSWERS

ENGLISH

1. Usually, completion, generally, results, while, length, components, occupation, formal, licence

2. Bathroom, water board, occupation, receipt, sprinkler, plumbing, gasfitting, draining, copper pipe, solar heating

Comprehension – (a)

1a. The bath is less likely to be damaged.
Could add - other tradesmen do not have to worry about damaging the bath while completing their work, do not have to protect the bath while other work is being completed.

2a. Secure the bath
Allow adequate clearance for flashing to ensure a watertight installation
Level the bath

3a. All relevant bylaws and approved fixing methods.

4a. Pipes need to be installed behind wall cladding
The baths flashing and support rim must be in behind the wall cladding which may require extensive work on the wall.
Further explanation of what these mean could be written

Comprehension - (b)

1b. Roxby Downs has low and variable rainfall that would provide limited water savings.

2b. No. The number of new dwellings being built is low and therefore Adelaide could run out of water long before existing homes have rain water tanks plumbed into their laundries and toilets. Evidence also suggests that a 1000 litre tank will be rapidly consumed if it does more than flush a toilet or supply laundry over summer.

3b. The tank must be connected to at least one toilet, laundry cold water outlets or a hot water supply

4b. It must include automatic switching between tank and mains water, mosquito control and backflow prevention devices.

MATHEMATICS

1. m, min, °C, kg, m², km/hr, ml, $ **2.** 25%, 16·37, 3/8, 2⅓, 5:4, 35°

3. a) 2,634, b) 56,087

4. a) 241cents, b) 26 weeks, c) 10,812seconds, d) 8000m, e) 3500g

5. 11 hours and 15 minutes   **6.** 2 hours and 40 minutes

7. a) $31.68, b) 786.019, c) 2,680cm or 2.68m

8. a) 3,434, b) 13·719

9. a) 68.7, b) 41.4, c) 392.7   **10.** a) .345, b) 216, c) 281

11. 22.4cm   **12.** a) ½

13. a) $4.40, b) 3·21   **14.** a)

15. a) K, b) G, c) P, d) J, e) C, f) L, g) B, h) Q, i) A, j) I, k) M, l) D, m) O, n) H, o) F, p) E, q) N

16 330 bricks   **17.** a) 36m, b) 32 units

18. 180km   **19.** $120

20. 15   **21.** 25

22. $460   **23.** $588

24. a) 40, b) 81, c) 20, d) 4, e) 8   **25.** 7

26. a) $8.10, b) $4.05   **27.** $516

28. $13   **29.** a) $2,600, b) $1,200

30. a) 350, b) $105, c) $455   **31.** 30km/l

32. a) 900litres, b) 2700litres