Practice Aptitude Assessment
for
Building and Construction Industry

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December 2005

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. The following text has 12 spelling errors in it. Correct those errors and list them in the order you find them in the text.

   _____
   _____
   _____

   Today the "Building and Construction 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 aprentice/trainee, construction worker or tradsperson. 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 form of the following words

   _____

a) Ellimination	f) Briklaying
b) Prefabrikated	g) Vocationl
c) Demolishon	h) Permision
d) Certifikate	i) Comitees
e) Sprinklar	j) Partisipate

   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____

Comprehension

Read the following passage and answer the questions in the spaces provided.

The construction industry, put simply, is an industry of which the purpose 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.

3.   What is the main purpose of the construction industry?

_____
_____
_____
_____

4.   What is the most important tool that is used in the building and construction industry to ensure a project is completed successfully?

_____
_____
_____
_____

5.   Explain how you would know if someone had understood an Instruction you gave them.

_____
_____
_____
_____

6.   List three different examples used to exchange information.

_____
_____
_____
_____

7.   Do you think effective communication is important in the building and construction industry? Why?

_____
_____
_____
_____

MATHEMATICS

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

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	2⅓

3. Write as a number:

    (a) two thousand six hundred and thirty four   _____
    (b) fifty six thousand and eighty seven.   _____

4. Round

    (a) 35·6754 to two decimal places   _____
    (b) 425·8 to the nearest tens   _____
    (c) 248 to the nearest hundreds   _____

5. Estimate the

    (a) height of a standard door   _____
    (b) length and width of A4 sized paper   _____
    (c) average weight of a medium sized egg   _____
    (d) amount a coffee cup will hold   _____
    (e) distance an adult will walk in a hour   _____
    (f) area of an adult's shoe   _____
    (g) boiling point of tap water   _____
    (h) angle between the floor and wall   _____
    (i) weight of a normal motor vehicle   _____

6. Write the following decimals in descending (largest to smallest) order. _____

7·19	71·9	0·719

7. Simplify:

       (a)   2+3 x 4 _____

       (b)   4–10÷2 _____

       (c) $\dfrac{50 \div 50}{2 \text{x} 25}$ _____

       (d)   (16–5)x3 _____

       (e)   (75÷5)÷(12÷4) _____

       (f) 8^2 _____

       (g) $\sqrt{25}$ _____

Operations (Addition, Subtraction, Division, Multiplication)

8. Subtract

    a. 1,784 from 5,218 _____

    b. 29·461 from 43·18 _____

9. Find the total of:

    a. $2, $21·45 and $8·23 _____

    b. 18·32, 471·019 and 315. _____

    c. 2·63m and 50cm _____

10. Multiply

    a. 6· 87 by 10 _____

    b. 13·8 by 3 _____

    c. 46·2 by 8·5

11. Divide

    a. 3·45 by 10 _____

    b. 3024 by 14 _____

    c. 56.2 by 0.2

12. Select the best estimate for each of the following:

       (a)   4249x71 _____

280000	150000	28000

       (b)   80000÷38 _____

200	2000	20000	4000

Fractions

13. Add the following

        (a) ¼ and ½   _____

        (b) 2/9 and 5/6   _____

        (c) 3¼ and 1/8   _____

14. Subtract the following:

        (a) 5/6 and 1/4

        (b) 21/14 and 4/7   _____

        _____

15. Express as a fraction in lowest terms:

        (a) 0·75   _____

        (b) 2·6   _____

        (c) 30%   _____

16. Which fraction is mid-way between ¼ and ¾?   _____

17. A carpenter was making a bookcase. He hit a nail 6½ cm long through a piece of wood 2¼ cm thick and into a large piece of wood. How far did the nail go into the large piece of wood?   _____

Percentages

18. Evaluate the following:

        (a) 10% of $44   _____

        (b) 25% of 12·84.   _____

19. Michelle earns $500 a week. She gets a pay rise of 5%. What is her new wage?   _____

20. An article bought for $250 is sold for $375. Find:

        (a) the profit   _____

        (b) the profit as a percentage of the cost price.   _____

21. Jonathan the painter buys the following from a paint store: paint $215; rollers and brushes $95; cleaning fluids $12; and plastic covers $8. Jonathan gets 10% trade discount. How much will Jonathan pay

        (a) without discount   _____

        (b) with discount?   _____

        (c) How much has he saved?   _____

22. Barry scored 80% in a TAFE exam. There were 25 questions.

        (a) How many questions did Barry get right?   _____

        (b) How many questions did Barry get wrong?   _____

Decimals

23.   Find the decimal number halfway between:

(a) 0·6 and 0·8   _____

(b) 2·8 and 2·9   _____

24.   A plastic pipe costs $8·00 a metre. How many complete metres of pipe could I buy for $60·00?   _____

25.   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?   _____

26.   Phil is a plasterer 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?   _____

Geometry

27.   Estimate the size of the following angles by selecting the appropriate answers from the list below.
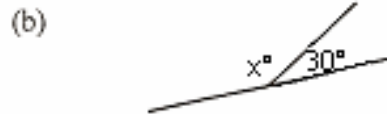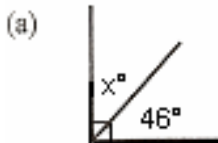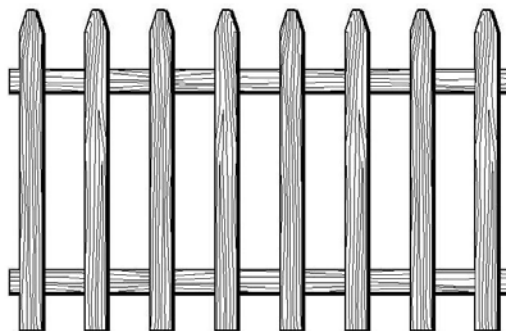

(a) 30
(b) 110
(c) 170   _____

(d) 30
(e) 110
(f) 170   _____

**28.**   Find the value of x° in the following:

_____

(a)   x°   46°

(b)   x°   30°

_____

9

Shapes

29.   Which shapes 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
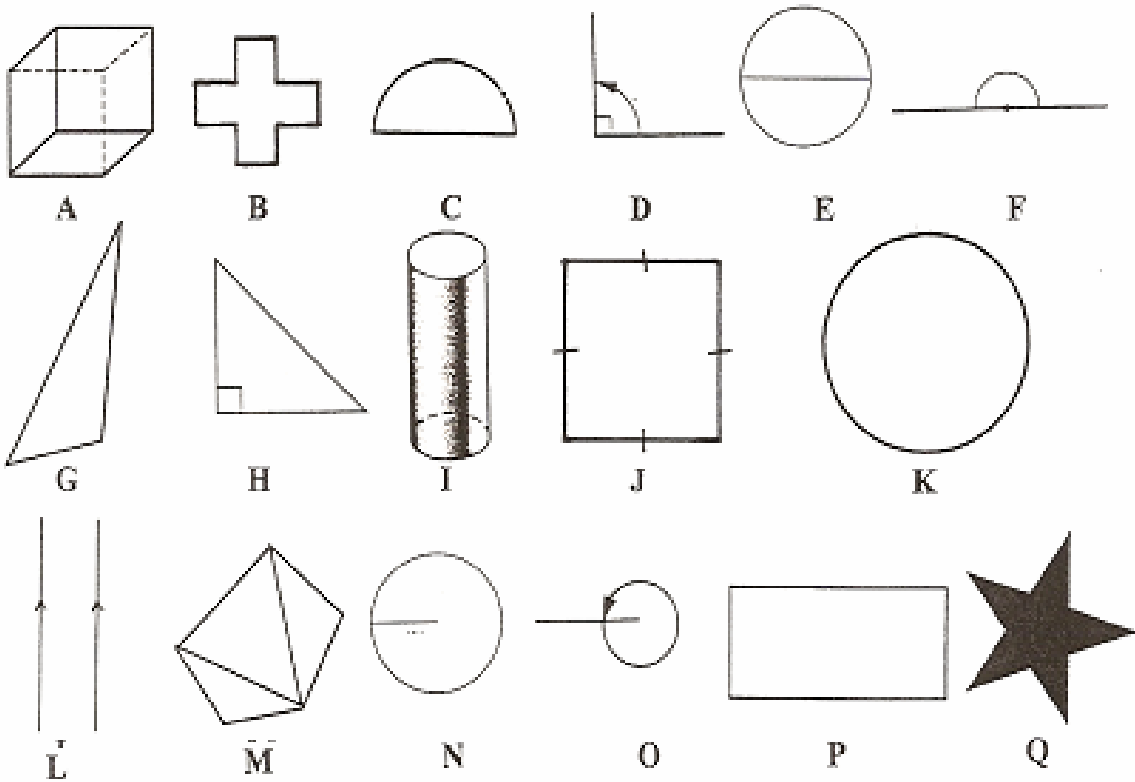
Perimeter, area, volume

30. Find the perimeter of these shapes.

(a)

15 m

3 m

(b)

2

11

9

3

_____

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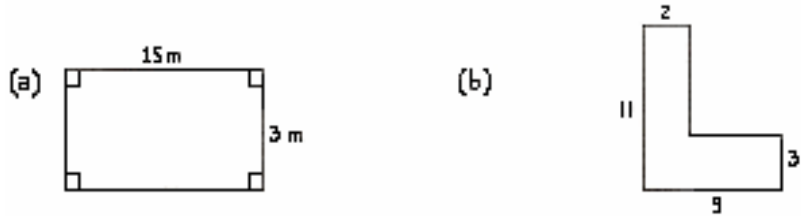
31. If each square represents 1 square centimeter, what is the area of the shape shown?

_____
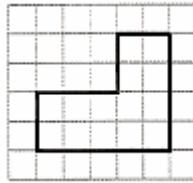
32. A bricklayer estimates there are 55 bricks to the square metre. How many bricks are needed for a 6 square metres wall?

_____

33. 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?

_____

34. In the question above, a quote to supply and lay the concrete is $10 per square metre, what is the cost of the path?

_____

35. 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?
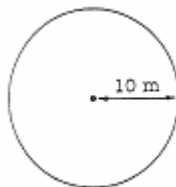
_____

36. David is going to paint his ceiling in the lounge room which measures 6 metres by 3 metres. One litre of ceiling paint covers 12 square metres.

(a) What is the area of the ceiling?
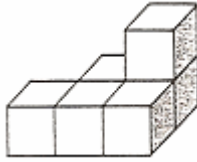(b) How many litres of paint will he use?

_____
_____
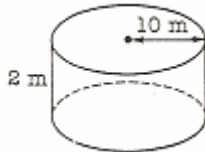
37. What is the area of these shapes?

(a)

2 m

4 m

(b)

8 m

10 m

_____

_____
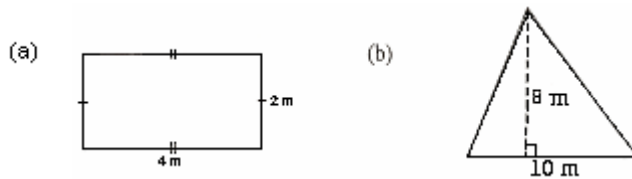
38. Calculate the area of this circle? Use **A= π r²** and π=3·14.
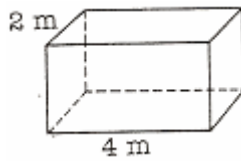
10 m

_____

39. If each cube represents 1 cubic centimetre, what is the total volume of the shape shown?   _____

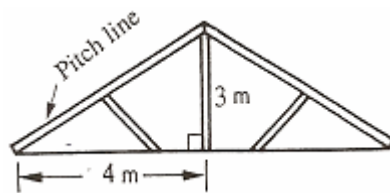**40.** Calculate the volume of the cylinder using the formula $V = \pi r^2 h$ and $\pi = 3 \cdot 14$.   _____

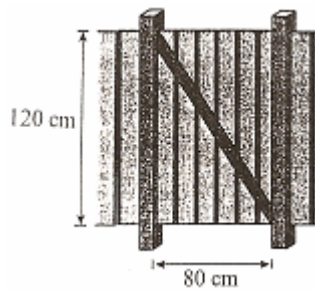**41** If the volume of this box is 24 cubic metres, how high are the sides?   _____

Pythagorus

**42.** Calculate the pitch line length of the gable roof?   _____

43. A wooden gate 80 cm wide and 120 cm high needs a diagonal brace for support. How long will the brace be?   _____


12

Ratio

44. A ready-mix company uses metal, sand and cement in the ratio of $7 \colon 5 \colon 3$. What amount of cement is needed for a 15 m³ job? _____

45. The scale on a drawing is $1 \colon 100$. What length will be represented by a measurement of 8 cm on the drawing? _____

46. What is the ratio of the number of circles to squares? _____
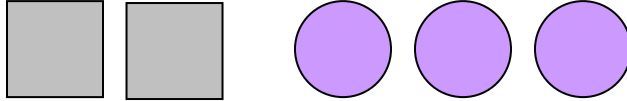
47. Adam always mixes 8 shovels of sand with 10 shovels of metal when he makes concrete. How many shovels of sand will Adam mix with 50 shovels of metal? _____

Problem Solving

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

49. Five litres of glue costs $65·00. How much will 1 litre cost? _____

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

    (a) monthly salary _____
    (b) fortnightly salary. _____

51. Peter the carpenter 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? _____

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

53. A 3600 litre water tank is a ¼ full.
    (a)   How much water is in the tank? _____
    (b)   How much is empty space? _____

54. 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? _____
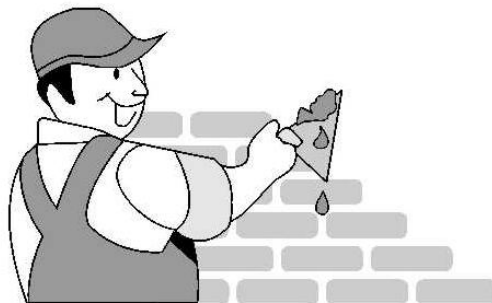
ANSWERS

ENGLISH

1. billion, commercial, majority, either, apprentice, tradesperson, concrete, steel, telecommunication, career, opportunities, employees
2. Elimination, Prefabricated, Demolition, Certificate, Sprinkler, Bricklaying, Vocational, Permission, Committees, Participate
3. The main purpose of the industry is to build structures. These structures could range from family homes to large business structures.

4. Communication is the most important tool or skill to use to ensure a project is completed successfully. There are so many stages between the start and completion of a structure that require people to communicate with each other.

5. You can tell if someone has understood the instruction you gave them from the feedback the receiver gives you. The feedback might be given to you verbally, ie: 'Yes I understand', could be given to you in written form, electronic or non-verbal ie: a nod of a head.
6. Verbal: speaking to each other, Written: sending a request, Electronic: sending an email
7. 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!!

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) 35·68, b) 430, c) 200
5. a) 2m, b) 30cm, 20cm c) 50g, d) 250-350ml, e) 3km, f) 240cm², g) 100°C, h) 90°, i) approx 1,400kg
6. 71·9, 7·19, 0·719
7. a) 24, b) -1, c) 2, d) 33, e) 5, f) 64, g) 5
8. a) 3,434, b) 13·719
9. a) $31.68, b) 804·339, c) 2680cm or 2·68m
10. a) 68·7, b) 41·4, c) 392.7
11. a) 0·345, b) 216, c) 281
12. a) 28,000, b) 2,000
13. a) ¾, b) 57/54 or 1 1/18, c) 27/8 or 3 3/8
14. a) 7/12, b) 21/14 or 1½
15. a) ¾, b) 13/5, c) 3/10
16. ½
17. 4¼cm
18. a) $4.40, b) 3·21
19. $525
20. a) $125, b) 50%
21. a) $330, b) $297, c) $33
22. a) 20, b) 5
23. a) 0·7, b) 2·85
24. 7
25. a) $8.10, b) $4.05
26. $516
27. a) 30°, e) 110°
28. a) 44°, b) 150°
29. 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
30. a) 36m, b) 32 units
31. 14cm²
32. 330 Bricks
33. 21·98m²
34. $219.80
35. 2,260·8cm³
36. a) 18m², b) 1·5litres
37. a) 8m², b) 40m²
38. 314m²
39. 6cm³
40. 628m³
41. 3m
42. 5m
43. √20,800cm
44. 3m³
45. 800cm
46. 3:2
47. 40
48. $120
49. $13.00
50. a) $2,600, b) $1,200
51. a) $350, b) $105, c) $455
52. 30km/l
53. a) 900 litres, b) 2,700 litres
54. 900 Bricks