PRE-APPRENTICESHIP
MATHS & LITERACY FOR
GENERAL CONSTRUCTION

graduated exercises and practice exam

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SAMPLE CHAPTER

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PRE-APPRENTICESHIP
Maths & Literacy for General Construction

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MATHEMATICS

Unit 4: General Mathematics

Short-answer questions

Specific instructions to students

- This unit will help you to improve your general mathematical skills.
- Read the following questions and answer all of them in the spaces provided.
- You may not use a calculator.
- You need to show all working.

QUESTION 1

State the unit of measurement that you would use to measure:

a the length of a steel rod

Answer:

_____

b the temperature of a truck engine

Answer:

_____

c an amount of oil

Answer:

_____

d the weight of a load

Answer:

_____

e the voltage of a battery

Answer:

_____

f the length of an extension cord

Answer:

_____

g the volume of concrete.

Answer:

_____

QUESTION 2

Give examples of how the following might be used in the construction industry.

a percentage

Answer:

_____

b decimal

Answer:

_____

c fraction

Answer:

_____

d mixed number

Answer:

---

e ratio

Answer:

---

f angle

Answer:

QUESTION 3
Convert the following units.

a 12 kg to grams

Answer:

---

b 4 tonnes to kilograms

Answer:

---

c 120 cm to metres

Answer:

---

d 1140 mL to litres

Answer:

---

e 1650 g to kilograms

Answer:

---

f 1880 kg to tonnes

Answer:

---

g 13 m to centimetres

Answer:

---

h 4.5 L to millilitres

Answer:

QUESTION 4
Write the following in descending order.

0.4   0.04   4.1   40.0   400.00   4.0

Answer:

QUESTION 5
Write the decimal number that is between:

a 0.2 and 0.4

Answer:

---

b 1.8 and 1.9

Answer:

---

c 12.4 and 12.6

Answer:

---

d 28.3 and 28.4

Answer:

---

e 101.5 and 101.7

Answer:

QUESTION 6
Round off the following numbers to two (2) decimal places.

a 12.346

Answer:

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---

b 2.251

Answer:

_____

c 123.897

Answer:

_____

d 688.882

Answer:

_____

e 1209.741

Answer:

_____

QUESTION 7

Estimate the following by approximation.

a $1288 \times 19 =$

Answer:

_____

b $201 \times 20 =$

Answer:

_____

c $497 \times 12.2 =$

Answer:

_____

d $1008 \times 10.3 =$

Answer:

_____

e $399 \times 22 =$

Answer:

_____

f $201 - 19 =$

Answer:

_____

g $502 - 61 =$

Answer:

_____

h $1003 - 49 =$

Answer:

_____

i $10\,001 - 199 =$

Answer:

_____

j $99.99 - 39.8 =$

_____

QUESTION 8

What do the following add up to?

a $4, $4.99 and $144.95

Answer:

_____

b 8.75, 6.9 and 12.55

Answer:

_____

c 65 mL, 18 mL and 209 mL

Answer:

_____

d 21.3 g, 119 g and 884.65 g

Answer:

_____

QUESTION 9

Subtract the following.

a 2338 from 7117

Answer:

_____

b 1786 from 3112

Answer:

_____

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c 5979 from 8014

Answer:

d 11 989 from 26 221

Answer:

e 108 767 from 231 111

Answer:

QUESTION 10

Use division to solve the following.

a 2177 divided by 7

Answer:

b 4484 divided by 4

Answer:

c 63.9 ÷ 0.3

Answer:

d 121.63 ÷ 1.2

Answer:

e 466.88 ÷ 0.8

Answer:

The following information is provided for question 11.

To solve using BODMAS, in order from left to right, solve the Brackets first, then Of, then Division, then Multiplication, then Addition and lastly Subtraction. The following example has been done for your reference.

EXAMPLE

Solve $(4 \times 7) \times 2 + 6 - 4$.

STEP 1

Solve the Brackets first: $(4 \times 7) = 28$.

STEP 2

No Division, so next solve Multiplication: $28 \times 2 = 56$.

STEP 3

Addition is next: $56 + 6 = 62$.

STEP 4

Subtraction is the last process: $62 - 4 = 58$.

FINAL ANSWER:

58

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QUESTION 11

Using BODMAS, solve the following.

a $(6 \times 9) \times 5 + 7 - 2$

Answer:

_____

b $(9 \times 8) \times 4 + 6 - 1$

Answer:

_____

c $3 \times (5 \times 7) + 11 - 8$

Answer:

_____

d $5 \times (8 \times 3) + 9 - 6$

Answer:

_____

e $7 + 6 \times 3 + (9 \times 6) - 9$

Answer:

_____

f $6 + 9 \times 4 + (6 \times 7) - 21$

Answer:

_____

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Unit 12: Area and Perimeter

QUESTION 1

A worker reads off a building plan that the floor area for a two-storey office building is $23\,m \times 28\,m$. What is the total area and perimeter of the floor?

Answer:

_____

QUESTION 2

On a building plan, an office measures $3\,m \times 4\,m$ and another floor measures $6\,m \times 7\,m$.

a What is the area of each?

Answer:

_____

b What is the perimeter of each?

Answer:

_____

c What is the total area when added together?

Answer:

_____

d What is the total perimeter when added together?

Answer:

_____

QUESTION 3

A building plan shows that a bathroom area measures $2.2\,m \times 1.8\,m$ and that an office floor measures $4.4\,m \times 5.2\,m$.

a What is the area of each?

Answer:

_____

b What is the perimeter of each?

Answer:

_____

QUESTION 4

A fence needs to be erected around the perimeter of a block of land. The lengths of the sides of the block of land are $34.5\,m$. The length of the back of the block is $19.3\,m$. What is the total amount of metres of fencing needed?

Answer:

_____

QUESTION 5

Trenches measuring $600\,mm \times 600\,mm$ need to be dug for sewerage and water on a block of land. The length of each trench varies and each measures $4.3\,m$, $6.9\,m$, $2.1\,m$, $4.7\,m$ and $5.3\,m$. What is the total length of all of the trenches?

Answer:

_____

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Unit 14: Applying Maths to the General Construction Trade

Section A: Digging trenches

Short-answer questions

Specific instructions to students

- This section is designed to help you improve your maths skills in the general construction trade.
- Read the following questions and answer all of them in the spaces provided.
- You may not use a calculator.
- You need to show all working.

QUESTION 1

A trench measures 15 m × 600 mm × 600 mm. If it takes 15 minutes to dig 1 m of the trench to the required dimensions with a trench digger, how long will it take to dig the whole trench?

Answer:

QUESTION 2

A series of trenches measures 12 m × 600 mm × 600 mm in total. The machinery has broken down and the trenches need to be dug by shovel by two workers. If it takes 35 minutes to dig 1 m of the trenches to the required dimensions by hand, how long will it take to dig the whole trench?

Answer:

QUESTION 3

A trench digger is hired for a week to dig trenches for a house. The cost of hiring the trench digger is $77 per day. If it takes 8 hours a day over a five-day week to complete most of the work, what will the hiring cost be?

Answer:

QUESTION 4

A building and construction company has four jobs on the go. They need a trench digger for work on each site at different times over four months. The equipment is hired at a cost of $308 per week, plus 10% GST. What will the hiring cost be?

Answer:

QUESTION 5

Two trench diggers are hired to dig the trenches for a retirement village. The cost of hiring each trench digger is $77 per day. The construction company hires the equipment for six days over a two-week period. What will the hiring cost be?

Answer:

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Section B: Concreting

QUESTION 1

An area measuring $5\,m \times 4\,m \times 15\,cm$ needs to be concreted. How many cubic metres need to be ordered?

Answer:

QUESTION 2

The bedroom floor of an apartment measures $3.8\,m \times 3.2\,m$. The depth of concrete needed is $15\,cm$. What volume of concrete is needed?

Answer:

QUESTION 3

A house has two bedrooms that measure $3.5\,m \times 4.2\,m$ and $4.3\,m \times 3.9\,m$. Concrete needs to be replaced in each room. If the depth of the concrete needs to be $15\,cm$, how many cubic metres of concrete are needed?
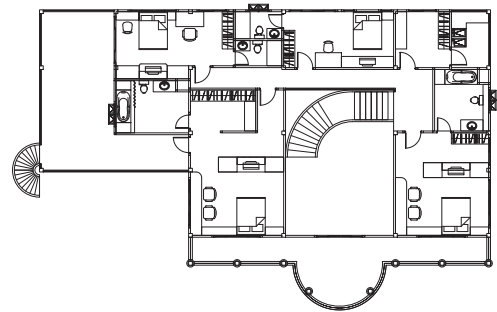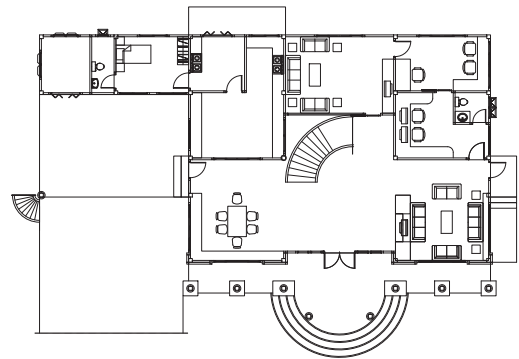
Answer:

QUESTION 4

The plan of a three-bedroom house shows four rooms that measure the following: bedroom 1 − $3.3\,m \times 3.6\,m$; bedroom 2 − $2.7\,m \times 3.45\,m$; bedroom 3 − $2.7\,m \times 3.1\,m$; and the family room − $4.3\,m \times 4.0\,m$. Each needs concreting to a depth of $0.15\,m$. What is the total volume?

Answer:

QUESTION 5

The floor plan of a house consists of two rectangular areas: $7.5\,m \times 14.6\,m$ and $3.2\,m \times 7.5\,m$. Concrete needs to be poured in this area to a depth of $0.15\,m$. How many cubic metres of concrete need to be ordered for this part of the building?

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Answer:

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Section C: Demolition

Short-answer questions

Specific instructions to students

- This section is designed to help you improve your maths skills in the general construction trade.
- Read the following questions and answer all of them in the spaces provided.
- You may not use a calculator.
- You need to show all working.

Working in demolition can be a challenging job – it is also potentially dangerous. Any given task can cost between $25 and $95 per hour, depending on the task's size and complexity. With an average cost of $61.22 per hour, the hiring of a demolition expert might be something that needs to be considered. There are some hazards associated with demolition that can be dangerous. Demolition is often considered to be high-risk work as there is a possibility that things may go wrong. Examples of problems can include the instability of a structure; poor or excessive loading on the floor; glass damage and, often, fragmentation; adverse weather conditions, including heat and cold; site access, which may be difficult; and the presence of asbestos.

QUESTION 1

A demolition company quotes for the demolition of a small house on a small block of land with easy access. They quote $75 per hour to demolish but not to clear the block. The company says that it will take three weeks to complete, and each week will be a 38-hour working week. How much is the quote from the company?

Answer:

QUESTION 2

Three quotes for the demolition of a house on a block that is 18 m × 33 m with easy access are received by the owners. The first quote is for $65 per hour to demolish. The second quote is for $77 per hour. The third quote is for $84 per hour. All three companies agree that it will take two weeks to complete the demolition, and each week will be a 38-hour working week. How much would each of the quotes be?

Answer:

QUESTION 3

A demolition company is contracted to demolish a two-storey house. They charge $68 per hour. If the job takes two weeks to complete with two workers on site each day for 38-hour working weeks, how much will the company charge?

Answer:

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QUESTION 4

A family receives a quote from a demolition company to demolish and remove all of the debris from their block. The demolition company charges $62 per hour and says it will take eight working days at 8 hours a day to complete the demolition. In addition, the demolition company charges $3500 to remove all the debris, clear the block, grade and level after the demolition. How much did the company charge in total?

Answer:

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Section D: Scaffolding

QUESTION 1

A builder requires scaffolding to continue rendering work on the exterior of a house. Rather than hire, the company decides to purchase a 2.5 m × 0.7 m × 5.0 m mobile aluminium scaffold for $3699.00. If 10% GST needs to be added to the price, plus a shipping cost of $250.00, what will the final cost be?

Answer:

QUESTION 2

A construction company purchases a two-level tower with 5.7 m reach height with a guardrail set for $2599.00, plus 10% GST and $475 shipping cost. What is the final total cost of the scaffold equipment?

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Answer:

QUESTION 3

A 3 m deck of scaffolding needs to be hired on a worksite for a number of different jobs for seven days. The best quote the company gets is as follows: $49 per deck height metre per seven-day week, including GST. The cartage rate each way and per unit is $61.50, including GST. What is the total hiring cost?

Answer:

QUESTION 4

A 5 m deck of scaffolding needs to be hired on a worksite for a number of different jobs for a month. The quote the company gets is as follows: $49 per deck height metre per seven-day week, including GST. The cartage rate each way and per unit is $61.50, including GST. The scaffold must be erected by a suitably qualified person. What is the total hiring cost?

Answer:

QUESTION 5

Four 4 m decks of scaffolding are hired for a worksite for three months. The quote the company gets that it considers to be the fairest is: $43 per deck height metre per seven-day week, including GST. The cartage rate each way and per unit is $54.50, including GST. What is the total cost of hiring all four decks for the three months?

Answer:

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Section E: Bobcats and heavy machinery

QUESTION 1

A quote for removing debris from renovations and levelling work around a house includes hiring a 1.3 tonne s70 bobcat with a 1180 mm bucket for three days. The quote is for $238 per day. How much will it cost to hire the bobcat for the three days?

Answer:

QUESTION 2

The hire rate for an s70 bobcat is $264 per day. The bobcat is hired out; however, it is returned late and incurs a late fee of $50. In addition, the bobcat needs 4 L of diesel to re-fuel it, costing $1.65 per litre. It was also returned caked with heavy clay and mud and so requires cleaning, incurring a cost of $35. What is the total cost to the hirer?

Answer:

QUESTION 3

A 2.6 tonne 51 hp bobcat, with a 4-in-1 bucket and a lifting capacity of 635 kg, is hired to remove rubbish and soil from a construction site over five days. The daily hire cost is $255.75. How much does it cost for the five-day hire? The job is incomplete at the end of the five days, so the hirer hires the bobcat for one more day at a fee of $311.00. What is the total cost for the six days?

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Answer:

QUESTION 4

A construction company wants to hire a 19 foot scissor lift to paint a new building and receives a quote of $120 for 24 hours. The company decides to hire the lift for four days. How much will this cost? The job takes much longer than first thought, so the company hires the lift for another three days. What is the total cost?

Answer:

QUESTION 5

A construction company needs to hire four boom lifts so that steel beams can be welded and painted. The electricians also need to use one to complete the wiring in the ceiling and walls of an industrial complex. The company hires three 45 foot (16 m) diesel 4WD knuckle booms at a cost of $1050 per week and a 30 foot (10.6 m) electrical knuckle boom at a cost $945 per week. The job takes two months to complete and the booms are hired for this period. What is the total cost?

Answer: