

DAWSAN'S MATHS EXPRESS

S.Edwards and D.Williams



Arundowne Place

NAME



DAWSAN'S
Maths
EXPRESS

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These fun calculations are devised
to be to be used in conjunction with the
Dawsan's Maths Dictionary.

Arundowne Place

A Do-It-Yourself enthusiast purchases a property that is in a state of disrepair. In the tasks that follow, he makes a number of improvements. Your task is to calculate the total cost of his repairs and improvements to the property.

TOTAL COST OF RENOVATIONS TO ARUNDOWNE PLACE

Fencing R

Swimming Pool

• Construction R

• Water R

Driveway R

Roof

• Cleaning R

• Painting R

• Guttering R

Paving R

Chicken Run R

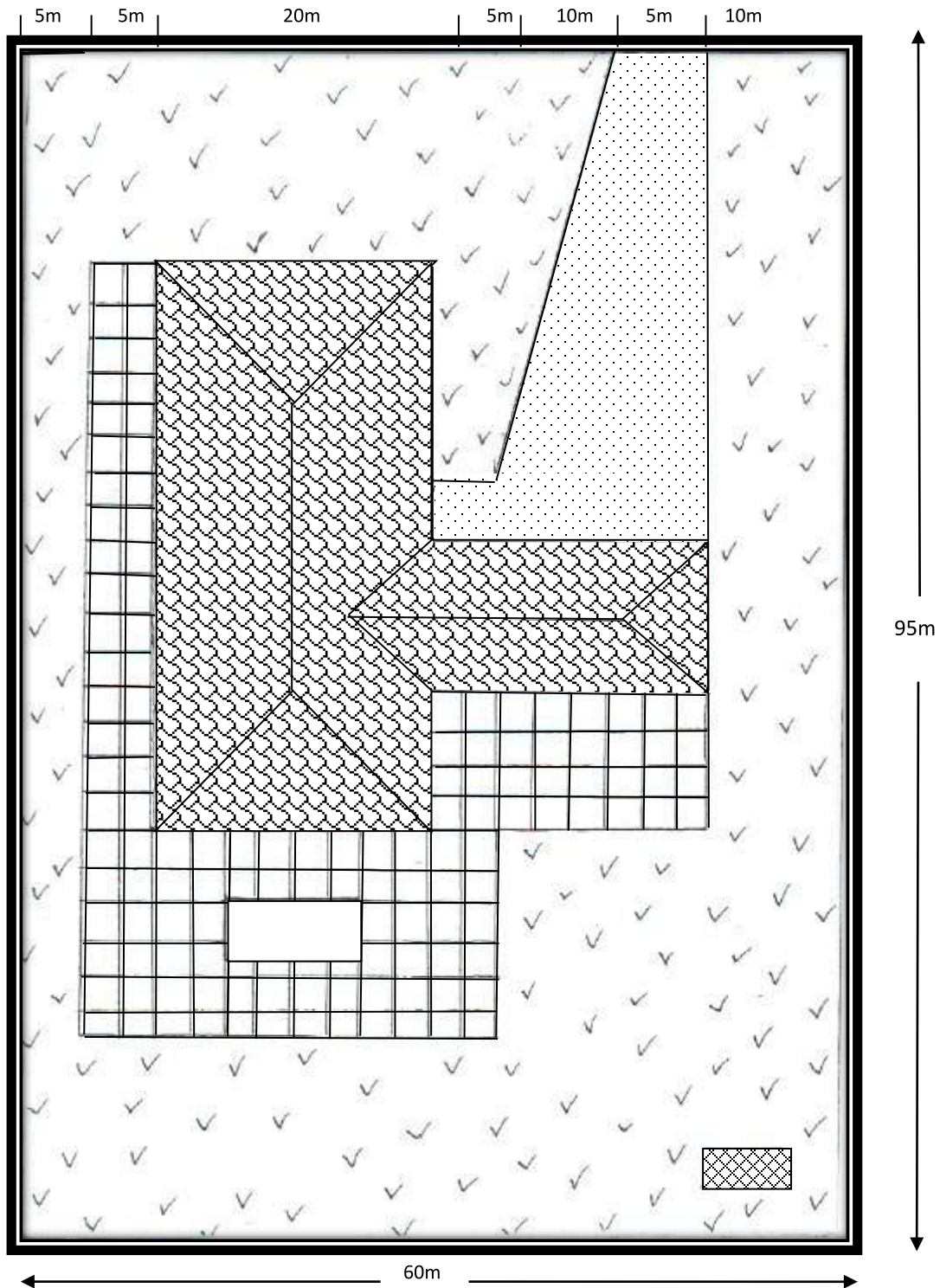
Octagonal Garden R

Plants R







TOTAL COST: R _____

Arundowne Place: Site Plan

Aerial view of the property showing the lay-out and dimensions of the site.



Key:

- | | | |
|--|---|--|
|  House and garage |  Lawn |  Driveway |
|  Paving |  Chicken run |  Swimming pool (4m x 8m) |

TASK 1: Fencing

Step one is to fence off the property. Mr.DIY responded to the following advertisement. He particularly wanted 1,8m palisade fencing with a matching sliding gate. Read the advert at the bottom of the page, then calculate the total cost of poles, fencing and a gate and deduct the given discount for DIY enthusiasts.

Number of panels needed	_____ x R625	Total Cost	_____
Number of poles needed	_____ x R100	Total Cost	_____
Size of gate needed	_____	Cost	_____
Type of motor needed	_____	Cost	_____
		Total	_____
		15% discount	_____
		Final cost of fencing	_____

↑ **SPIKE- Q -FENCING** ↑

Approved installers of domestic and industrial fencing

1,5m panels per 5m length R562p/m
 1,8m panels per 5m length R625p/m
 2,0m panels per 5m length R765p/m
 Poles (placed at 5m intervals) R100 each

2 x swing gates (Includes opening mechanisms)	1,5m x 3m R3 950	1,8m x 3m R4 760	2,0m x 3m R5 660
	1,5m x 4m R4 350	1,8m x 4m R5 240	2,0m x 4m R6 230
	1,5m x 5m R5 330	1,8m x 5m R6 550	2,0m x 5m R7 240

Single sliding gate (Includes track and portals)	1,5m x 3m R2990	1,8m x 3m R3 840	2,0m x 3m R4 240
	1,5m x 4m R3870	1,8m x 4m R4 760	2,0m x 4m R5 220
	1,5m x 5m R 4230	1,8m x 5m R5 843	2,0m x 5m R6220

Gate Motors:	Duraswing (swing gates)	Motor	2,0m per gate	R4 400
	Solo Domestic (sliding)	Max. gate length	6m	R3 500
	Condo Industrial (sliding)	Max. gate length	11m	R4 800

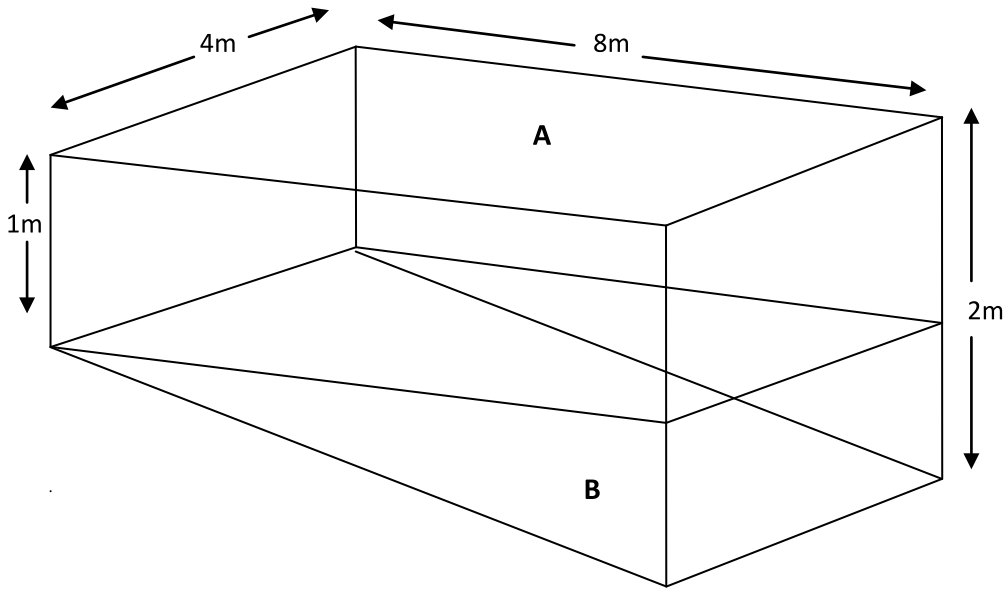
SUMMER SPECIAL 15% Discount for DIY enthusiasts. Contact us on 031 572 3671

After hours: Kevin 082 7166054

sales@spikeq.co.za

TASK 2: Swimming Pool

Before Mr DIY can pave the house surrounds, he must put in the swimming pool. This was calculated at a cost of R500 per m^3 . To calculate the total volume of the swimming pool, find the volume of section A, then $\frac{1}{2}$ the volume of A (which is the volume of B). Use the diagram below (not drawn to scale) to guide you.



Volume of A = _____

Volume of B = _____

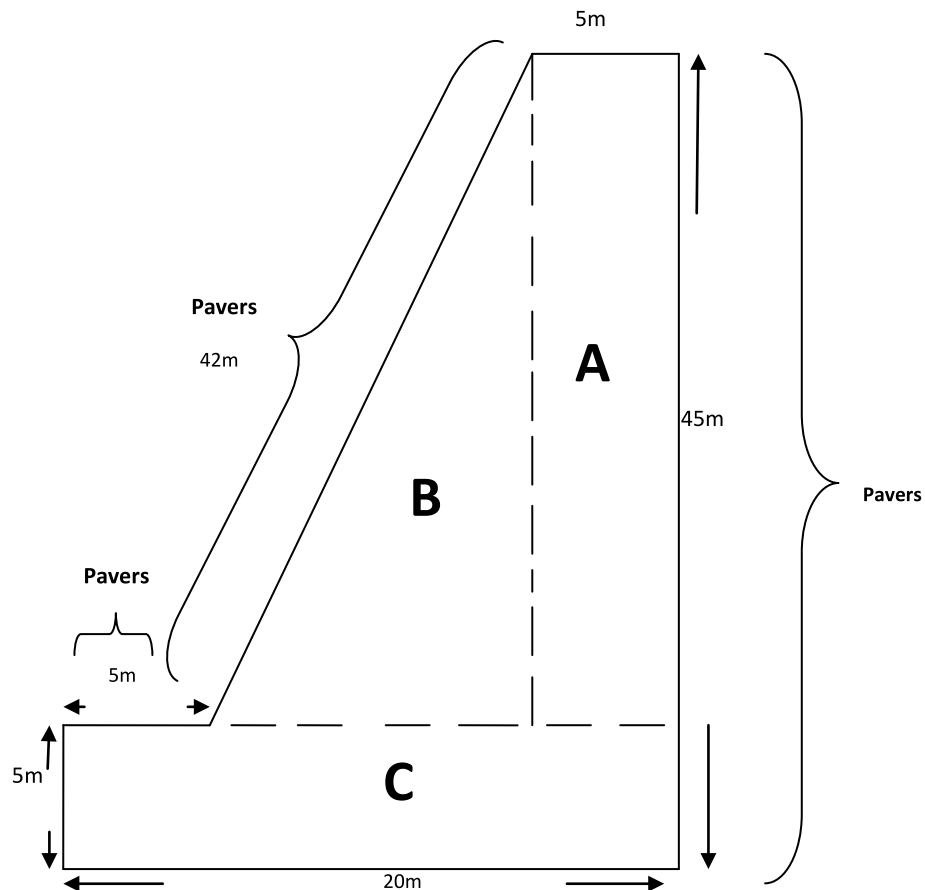
Total Volume = _____

Cost of construction = _____ m^3 x R500 = _____

If water costs R10 per kilolitre ($1m^3 = 1kl$) find the cost of filling this pool with water.

TASK 3: Driveway

Here our keen renovator gets down to laying out an asphalt (tarred) driveway. The best quote that he was given was R200 per square metre for the asphalt and R40 per linear metre for the curb pavers. Work out the area of the driveway, then the cost of the asphalt. If he places curb pavers along three lengths of the perimeter (as indicated), calculate the number of pavers needed and thereafter the total cost of the driveway.



Area of A = _____ = _____

Area of B = _____ = _____

Area of C = _____ = _____

TOTAL AREA = _____

Cost of asphalt = _____ x _____ = _____

Number of pavers needed = _____ + _____ + _____ = _____

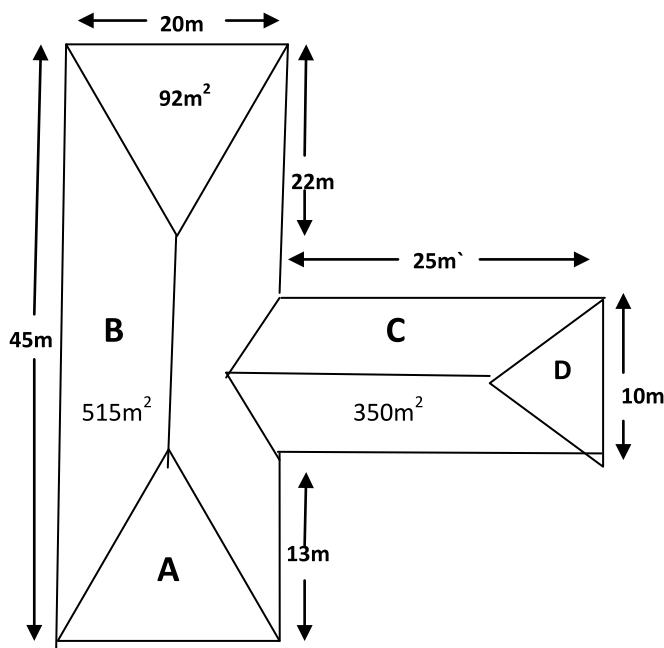
Cost of pavers = _____ x _____ = _____

TOTAL COST OF DRIVEWAY = _____

TASK 4: Roof

Mr. DIY now has the task of cleaning the roof in preparation for painting. He decides to hire a pressure cleaner from "Hi-A-It" at the cost of R350 per day and R50 for every hour thereafter. He pays for the cost of two days, presuming he will finish the job in this time. He collected the pressure cleaner at 8:00am on Tuesday morning, but only returned it on Thursday morning at 11:00 am. Having got that job out of the way, he proceeds with the painting of the roof. Find the total area of the roof and then reading the instructions on the paint tin, find out how much paint he will need and calculate the cost. Finally he replaces the guttering at a cost of R65 per metre.

a) Cost for the hire of the pressure cleaner = _____



$$\text{Area of A} = 92\text{m}^2$$

$$\text{Area of B} = 515\text{m}^2$$

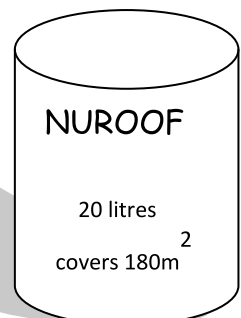
$$\text{Area of C} = 350\text{m}^2$$

b) Area of Roof = $(2 \times \text{Area A}) + (2 \times \text{Area B}) + (2 \times \text{Area C})$

[Can you see why it is not necessary to include the area marked as D?]

$$\text{Area of Roof} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

c) If the cost of the paint is R900 per 20 litres, how much paint is needed and what will it cost?



d) Cost of guttering = _____

TASK 5: Chicken run

Mr DIY decides to repair the existing chicken run. Whilst the wooden frame-work is still in a good condition, he needs to replace the chicken wire on two sides and the front, as well as the corrugated sheeting on the roof and the back of the structure.

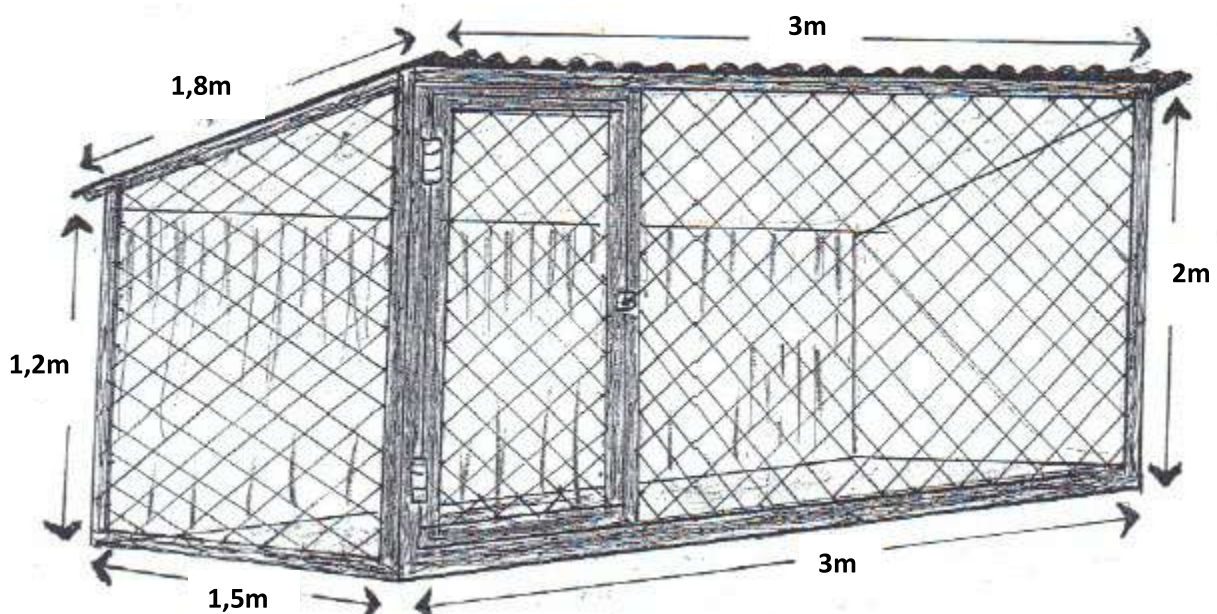
- a) The corrugated sheeting is sold in lengths of 3,6m with a width of 1,2m and the cost is R90,00 per sheet. The hardware shop offers a free cutting service, so Mr DIY decides to buy the required number of sheets and have them cut to fit the roof length of 1,8m; and the back length of 1,2m. (He can only buy full sheets, so if, for example, $2\frac{1}{2}$ are needed he will have to buy 3 full sheets).

No. of sheets required \times R90,00 = _____ = _____

- b) The chicken wire that Mr DIY decided to buy was 2m in width. He buys enough to cover the length of both sides and the front, and trims it to fit. This is priced at R50 per m.

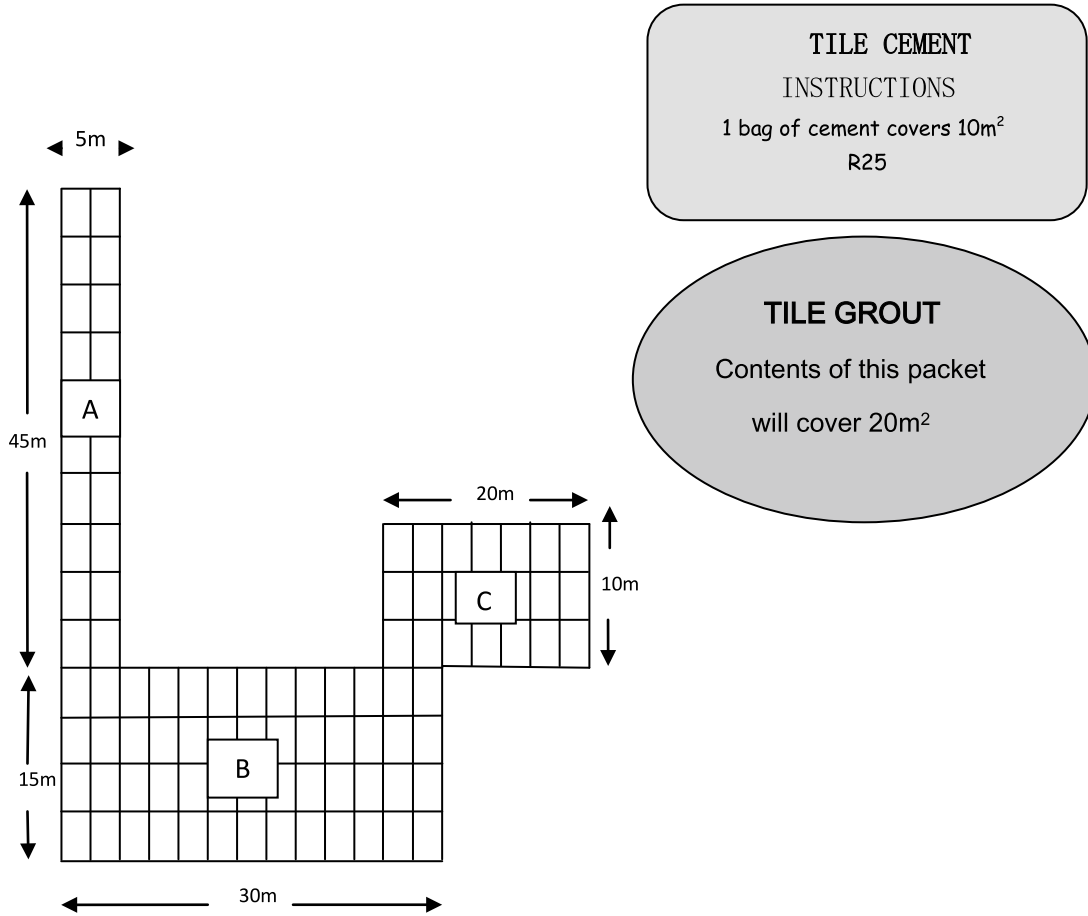
Number of metres needed \times R50,00 = _____

- c) TOTAL COST OF REPAIRS TO CHICKEN RUN = _____



TASK 6: Paving

Mr DIY now faces the onerous task of paving on 3 sides of the house. He uses the following plan to calculate the total number of square metres needed. He then selects a paving tile which costs R80 per m^2 . Find the total cost of the paving. He also buys tiling cement and grouting according to the instructions.



Area of A = _____ = _____

Area of B = _____ = _____

Area of C = _____ = _____

TOTAL AREA = _____

Cost of Paving Tiles = _____ = _____

Cost of Tiling Cement = _____ = _____

Cost of Grouting = _____ = _____

TOTAL AMOUNT DUE = _____

TASK 7: Plants

Responding to the advert below, Mr DIY orders the following plants from the nursery in his neighbourhood and is delighted with his discount!

5% discount for orders of R100 or more!

10% discount for orders of R250,00 or more!



15% discount for orders of R500,00 or more

20% discount for orders of R1 000 or more!

SALE NOW ON. FREE DELIVERY WITHIN 20km RADIUS. JUST PLACE YOUR ORDER!

031 7643522 OR EMAIL US AT bloomingbeautiful@.co.za

R55

Roses
Hydrangeas
Antirrhinums
Clivia
Ass. Palms

R35

Day Lilies
Irises
Bromeliads
Poinsettia
Agapanthus

R25

Azaleas
Ivy
Jasmine
Dracaena
Strelitzia

R15

Mondo Grass
Petunias
Carnations
Begonias
Ass. Ferns

ORDER FOR MR DIY

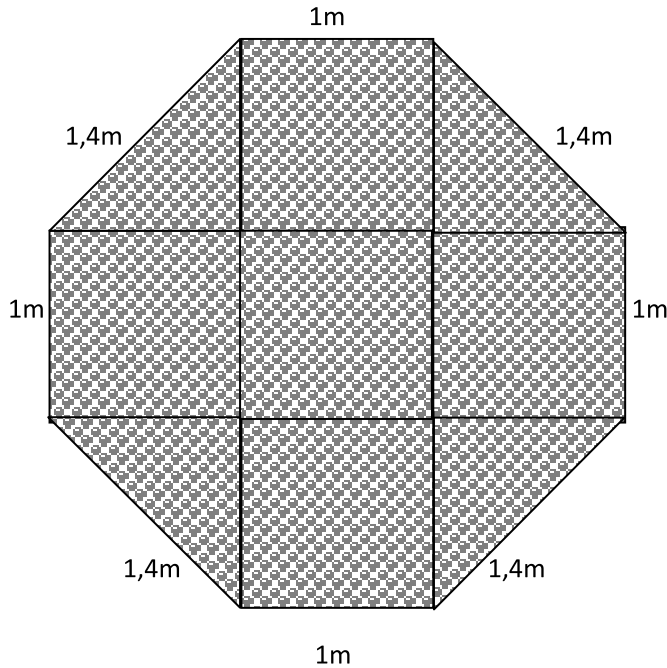
20 x Mondo Grass _____
10 x Azalea _____
4 x Ass. Palms _____
4 x Clivia _____
2 x Strelitzia _____

8 x Agapanthus _____
8 x Day Lilies _____
4 x Ass. Ferns _____
2 x Bromeliads _____
6 x Ivy _____

TOTAL _____
Discount _____
AMOUNT DUE _____

TASK 8: The Garden

The final task in this assignment is to create an octagonal garden on the front lawn. Below is a plan of the proposed garden and your task is to find the area of the garden so as to apply compost, and the perimeter in order to plant Mondo grass (30cm apart) around the edge.



- a) Mr DIY buys fertilizer in 10kg bags and each bag is sufficient to cover 2m^2 . How many bags of fertilizer does he need and if each bag costs R85, find the total cost.

Area of garden = _____

No. of bags needed = _____

Cost of fertilizer = _____

- b) Along the outer edge of the garden Mr DIY plants Mondo grass 30cm apart.

Perimeter of garden = _____

No. of plants needed = _____

Cost of mondo grass (refer to previous task) = _____

- c) TOTAL COST OF GARDEN = _____



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Answers

TASK 1:

Number of panels needed	61 x R625	Total Cost	R38 125,00
Number of poles needed	62 x R100	Total Cost	R 6 200,00
Size of gate needed	1,8m x 5m	Total Cost	R 5 843,00
Type of motor needed	Solo Domestic	Cost	R 3 500,00
		Total	R53 668,00
		15% discount	<u>R 8 050,20</u>
		Final cost of fencing	<u>R45 617,80</u>

TASK 2:

Volume of A	= l x b x d = 8m x 4m x 1m	= 32m ³	
Volume of B	= $\frac{1}{2}$ volume of A	= 16m ³	
Total Volume		= <u>48m³</u>	
Cost of construction	= 48m ³ x R500	= R24 000	}
Cost of water	= 48 x R10	= R480	

TASK 3:

Area of A	= l x b = 40m x 5m	= 200m ²
Area of B	= $\frac{1}{2}$ b x h = 5m x 40m	= 200m ²
Area of C	= l x b = 20m x 5m	= 100m ²
Total Area		= <u>500m²</u>
Cost of Asphaltting	= R200 x 500m ²	= R100 000
Number of pavers needed	= 5 + 42 + 45	= 92
Cost of pavers	= 92 x R40	= R3 680
TOTAL COST OF DRIVEWAY	= R100 000 + R3 680	= R103 680

TASK 4:

$$\text{Cost of hiring} = R700 + R150 = \mathbf{R850}$$

$$\text{Area of roof} = (92\text{m}^2 + 515\text{m}^2 + 340\text{m}^2) \times 2 = 1894\text{m}^2$$

$$\text{No. of 20l tins of paint needed} = 1894\text{m}^2 \div 180 = 10,6 \quad \therefore 11 \text{ tins needed}$$

$$\text{Cost of paint} = 11 \times R900 = \mathbf{R9\ 900}$$

$$\begin{aligned} \text{Cost of guttering} &= [45\text{m} + 20\text{m} + 22\text{m} + 25\text{m} + 10\text{m} + 25\text{m} + 13\text{m} + 20\text{m}] \times R65 \\ &= 180 \times R65 \\ &= \mathbf{R11\ 700} \end{aligned}$$

TASK 5:

No. of sheets required = 3 (2 lengths of 3,6m cut in half will give 4 lengths of 1,8m. He will need 3 of these for the roof and one left over for the back. He will have to buy another length to complete the back section and cut all to lengths of 1,2m. Therefore 3 lengths are needed in total.)

$$\text{Cost of corrugated sheeting} = 3 \times R90,00 = R270$$

No. of metres of chicken wire needed = 6m (3m for the front and 2 x 1,5m for the sides.)

$$\text{Cost of chicken wire} = 6\text{m} \times R50,00 = R300,00$$

$$\text{Total Cost} = \mathbf{R\ 570,00}$$

TASK 6:

$$\text{Area of A} = 45\text{m} \times 5\text{m} = 225\text{m}^2$$

$$\text{Area of B} = 15\text{m} \times 30\text{m} = 450\text{m}^2$$

$$\text{Area of C} = 20\text{m} \times 10\text{m} = 200\text{m}^2$$

$$\text{TOTAL AREA} = 875\text{m}^2$$

$$\text{Cost of paving} = 875\text{m}^2 \times R80,00 = R70\ 000$$

$$\text{Cost of tile cement} = 875\text{m}^2 \div 10 = 87,5 \quad \therefore 88 \text{ packets} \times R25 = R2\ 200$$

$$\text{Cost of Grouting} = 875\text{m}^2 \div 20 = 43,75 \quad \therefore 44 \text{ packets} \times R15 = R660$$

$$\text{TOTAL COST} = \mathbf{R72\ 860}$$

TASK 7:

20 x Mondo Grass	20 x R15	= R300
8 x Agapanthus	8 x R35	= R280
10 x Azalia	10 x R25	= R250
8 x Day Lilies	8 x R35	= R280
4 x Ass. Palms	4 x R55	= R220
4 x Ass. Ferns	4 x R15	= R 60
4 x Clivia	4 x R55	= R220
2 x Bromiliad	2 x R35	= R 70
2 x Strelitzia	2 x R25	= R 50
6 x Ivy	6 x R25	= R150
TOTAL		= R1 880
20% Discount		= <u>R 376</u>
AMOUNT DUE		= <u>R1 504</u>

TASK 8:

$$\begin{aligned}\text{Area of garden} &= 7 \times 1\text{m}^2 \\ &= 7\text{m}^2\end{aligned}$$

$$\begin{aligned}\text{No. of bags needed} &= 7\text{m}^2 \div 2\text{m}^2 \\ &= 3\frac{1}{2} \quad \therefore \text{He needs to buy 4 bags}\end{aligned}$$

$$\begin{aligned}\text{Cost of fertilizer} &= 4 \times \text{R}85 \\ &= \text{R}340\end{aligned}$$

$$\begin{aligned}\text{Perimeter of garden} &= 1\text{m} + 1\text{m} + 1\text{m} + 1\text{m} + 1,4\text{m} + 1,4\text{m} + 1,4\text{m} + 1,4\text{m} \\ &= 9,6\text{m}\end{aligned}$$

$$\begin{aligned}\text{No. of plants needed} &= 9,6\text{m} \div 0,3\text{m} \\ &= 32\end{aligned}$$

$$\begin{aligned}\text{Cost of Mondo grass} &= 32 \times \text{R}15 \\ &= \text{R}480\end{aligned}$$

$$\begin{aligned}\text{Total Cost of garden} &= \text{R}340 + \text{R}480 \\ &= \text{R}820\end{aligned}$$

TOTAL COST OF RENOVATIONS TO ARUNDOWNE PLACE

Fencing R 45 617,80

Swimming Pool

- Construction R 24 000,00
- Water R 480,00

Driveway R 103 680,00

Roof

- Cleaning R 850,00
- Painting R 9 900,00
- Guttering R 11 700,00

Paving R 72 860,00

Chicken Run R 570,00

Octagonal Garden R 820,00

Plants R 1 504,00

TOTAL COST: R 271 981,80



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