Eastern Goldfields College
Mathematics Essentials 2018
Investigation 2 – Room Renovation - MARKING KEY

Note: Minus 1 mark (overall) if units left out or incorrect *TOTAL = 35 MARKS*

Question 1 Calculate the area of the door *(1 mark each point TOTAL = 2 marks)*

Room 1
- Area = 0.9 x 2
- Area = 1.8m^2

Room 2
- Area = 1.8 x 2
- Area = 3.6m^2

Room 3
- Area = 0.95 x 2
- Area = 1.9m^2

Room 4
- Area = 0.95 x 2.05
- Area = 1.9475m^2

Room 5
- Area = 1 x 2.05
- Area = 2.05m^2

Question 2 Calculate the area of the window. *(1 mark each point TOTAL = 2 marks)*

Room 1
- Area = 1.3 x 0.65
- Area = 0.845m^2 (accept 8450cm^2)

Room 2
- Area = 1.2 x 0.6
- Area = 0.72m^2 (accept 7200cm^2)

Room 3
- Area = 1.25 x 0.75
- Area = 0.9375m^2 (accept 9375cm^2)

Room 4
- Area = 1.25 x 0.65
- Area = 0.8125m^2

Room 5
- Area = 1.25 x 0.65
- Area = 0.8125m^2 (accept 8125cm^2)

Question 3 **a)** Calculate the area of each wall in the room. To complete this question:

- Draw a diagram of each wall, including its dimensions.

(1/2 mark each correctly drawn wall TOTAL = 2 marks)

Room 1 – Diagrams showing:
- Wall A = 3.1m x 2.2m
- Wall B = 3.3m x 2.2m
- Wall C = 3.1m x 2.2m
- Wall D = 3.3m x 2.2m

Room 2 – Diagrams showing:
- Wall A = 3.4m x 2.2m
- Wall B = 3.5m x 2.2m (accept 350cm x 220cm)

- Wall C = 3.4m x 2.2m
- Wall D = 3.5m x 2.2m (accept 350cm x 220cm)

Room 3 – Diagrams showing:

- Wall A = 3.05m x 2.3m
- Wall B = 2.9m x 2.3m
- Wall C = 3.05m x 2.3m
- Wall D = 2.9m x 2.3m

Room 4 – Diagrams showing:

- Wall A = 3.15m x 2.2m
- Wall B = 3.05m x 2.2m (accept 305cm x 220cm)
- Wall C = 3.15m x 2.2m
- Wall D = 3.05m x 2.2m (accept 305cm x 220cm)

Room 5 – Diagrams showing:

- Wall A = 3.2m x 2.25m (accept 320cm x 225cm)
- Wall B = 2.9m x 2.25m (accept 290cm x 225cm)
- Wall C = 3.2m x 2.25m (accept 320cm x 225cm)
- Wall D = 2.9m x 2.25m (accept 290cm x 225cm)

- Show **all** your working out so that your answer can be checked.

(TOTAL = 8 marks – see allocation of marks below)

Room 1:

- Wall A = 3.1m x 2.2m
  = 6.82 [1 mark]
  = 6.82 – 1.8 – 0.845 [1 mark]
  = 4.175m^2 [1 mark]
- Wall B = 3.3m x 2.2m [1 mark]
  = 7.26m^2 [1 mark]
- Wall C = 3.1m x 2.2m [1 mark]
  = 6.82m^2 [1 mark]
- Wall D = 3.3m x 2.2m
  = 7.26m^2 [1 mark]

Room 2:

- Wall A = 3.4m x 2.2m
  = 7.48 [1 mark]
  = 7.48 – 3.6 – 0.72 [1 mark]
  = 3.16m^2 [1 mark]
- Wall B = 3.5m x 2.2m [1 mark]
  = 7.7m^2 (accept 77000cm^2) [1 mark]
- Wall C = 3.4m x 2.2m [1 mark]
  = 7.48m^2 [1 mark]
- Wall D = 3.5m x 2.2m
  = 7.7m^2 (accept 77000cm^2) [1 mark]

Room 3:

- Wall A = 3.05m x 2.3m
  = 7.015 [1 mark]
  = 7.015 – 1.9 – 0.9375 [1 mark]
  = 4.1775m^2 [1 mark]
- Wall B = 2.9m x 2.3m [1 mark]
  = 6.67m^2 [1 mark]
- Wall C = 3.05m x 2.3m [1 mark]
  = 7.015m^2 [1 mark]

- Wall D = 2.9m x 2.3m
  = 6.67m^2 [1 mark]

Room 4:

- Wall A = 3.15m x 2.2m
  = 6.93 [1 mark]
  = 6.93 – 1.9475 – 0.8125 [1 mark]
  = 4.17m^2 [1 mark]

- Wall B = 3.05m x 2.2m [1 mark]
  = 6.71m^2 [1 mark]

- Wall C = 3.15m x 2.2m [1 mark]
  = 6.93m^2 [1 mark]

- Wall D = 3.05m x 2.2m
  = 6.71m^2 [1 mark]

Room 5:

- Wall A = 3.2m x 2.25m
  = 7.2 [1 mark]
  = 7.2 – 2.05 – 0.8125 [1 mark]
  = 4.3375m^2 [1 mark]

- Wall B = 2.9m x 2.25m [1 mark]
  = 6.525m^2 [1 mark]

- Wall C = 3.2m x 2.25m [1 mark]
  = 7.2m^2 [1 mark]

- Wall D = 2.9m x 2.25m
  = 6.525m^2 [1 mark]

b) What is the total area of the walls? *(1 mark each correct answer)*

Room 1:

- 4.175 + 7.26 + 6.82 + 7.26 = 25.515m^2

Room 2:

- 3.16 + 7.7 + 7.48 + 7.7 = 26.04m^2

Room 3:

- 4.1775 + 6.67 + 7.015 + 6.67 = 24.5325m^2 (accept 24.533m^2)

Room 4:

- 4.17 + 6.71 + 6.93 + 6.71 = 24.52m^2

Room 5:

- 4.3375 + 6.525 + 7.2 + 6.525 = 24.5875m^2 (accept 24.588m^2)

Question 4 The frame around the door is wooden.

a) What length is needed to replace the frame around the door?
(1 mark for working out and 1 mark for correct answer TOTAL = 2 marks)

Room 1:

- 2 + 2 + 0.9
- = 4.9m

Room 2:

- 2 + 2 + 1.8
- = 5.8m

Room 3:

- 2 + 2 + 0.95
- = 4.95m

Room 4:

- 2.05 + 2.05 + 0.95
- = 5.05 (accept 505cm)

Room 5:

- 2.05 + 2.05 + 1
- = 5.1m

b) If you have been quoted $11 per metre, what would it cost to buy the wood for the frame? *(1 mark for working out and 1 mark for correct answer TOTAL = 2 marks)*

Room 1:

- 4.9 x 11
- = $53.90

Room 2:

- 5.8 x 11
- = $63.80

Room 3:

- 4.95 x 11
- = $54.45

Room 4:

- = 5.05 x 11
- = $55.55

Room 5:

- 5.1 x 11
- = $56.10

Question 5 Skirting board is a decorative edge that goes around the bottom of the room, where the wall meets the floor.

a) What length of skirting board is needed to go around the room?
(1 mark for working out and 1 mark for correct answer TOTAL = 2 marks)

Room 1:

- 3.1 + 3.3 + 3.3 + 2.2
- = 11.9m

Room 2:

- 3.4 + 3.5 + 3.5 + 1.7
- = 12.1m

Room 3:

- 3.05 + 2.9 + 2.9 + 2.1
- = 10.95m

Room 4:

- = 3.15 + 3.05 + 3.05 + 2.2
- = 11.45m

Room 5:

- 3.2 + 2.9 + 2.9 + 2.2
- = 11.2m

b) What will this cost at $4.80 per metre?
(1 mark for working out and 1 mark for correct answer TOTAL = 2 marks)

Room 1:

- 11.9 x 4.8
- = $57.12

Room 2:

- 12.1 x 4.8
- = $58.08

Room 3:

- 10.95 x 4.8
- = $52.56

Room 4:

- 11.45 x 4.8

- = $54.96

Room 5:

- 11.2 x 4.8
- = $53.76

Question 6 You need to paint three walls in your room and wallpaper the fourth one. This will be a feature wall. 4L of Taubmans Endure paint costs $68.50 and covers 64 m^2. 2L of Dulux Wash & Wear paint costs $53.50 and covers 32 m^2. Wallpaper is sold in rolls 52 cm wide and 10m long and costs $57.67 each

a) How much paint will you need to do two coats? *(2 marks)*

Workings to show that any combinations of 3 walls in all rooms will have a greater area than 32m^2. (1 mark)

There for all rooms will require a 4L tin (1 mark)

b) Calculate the cost of paint for the room. *(1 mark)*

4L tin costs $68.50

Calculate the cost of wallpaper for your room. *(4 marks)*

1 roll covers 5.2m^2 (1 mark)

Using answers from Qn 3(a)

- Wall A in each Room will require 1 roll. (1 mark)

  OR

- Walls B,C,D will each require 2 rolls (1 mark)

- Cost = No. of Rolls x $56.67 (1 mark)

  = $56.67 or $113.34 (1 mark)

Question 7 The renovation for this room will be the new frame around the door, the skirting board, two coats of paint for the room and the wall paper. What is the total cost of the room renovation?

(1 marks)

(1 mark for correct answer TOTAL)

Room 1:

Wall A wallpapered = 53.90 + 57.12 + 68.50 + 56.67
= $236.19

Walls B, C or D Wallpapered = 53.90 + 57.12 + 68.50 + 113.34
= $292.86

Room 2:

Wall A wallpapered = 63.80 + 58.08 + 68.50 + 56.67
= $247.05

Walls B, C or D Wallpapered = 63.80 + 58.08 + 68.50 + 113.34
= $303.72

Room 3:

Wall A wallpapered = 54.45 + 52.56 + 68.50 + 56.67
= $232.18

Walls B, C or D Wallpapered = 54.45 + 52.56 + 68.50 + 113.34
= $288.85

Room 4:

Wall A wallpapered = 55.55 + 54.96 + 68.50 + 56.67
= $235.68

Walls B, C or D Wallpapered = 55.55 + 54.96 + 68.50 + 113.34
= $292.35

Room 5:

Wall A wallpapered = 56.10 + 53.76 + 68.50 + 56.67
= $235.03

Walls B, C or D Wallpapered = 56.10+ 53.76 + 68.50 + 113.34
= $291.70

Question 8 Americans use **imperial measures**, for example feet and inches.

(1 mark for converting to cm)

a) What is an inch in centimetres? One inch = 2.54 cm

b) What is the height of the door in inches?

(1 mark for correct working and 1 mark for answer)

Rooms 1, 2, 3

- 200 / 2.54
- = 78.7 inches

Rooms 4 and 5

- 205 / 2.54
- = 80.7 inches

c) Calculate the approximate area of the wallpaper in square feet.

m^2 to ft^2 = m^2 x 10.76

Room 1:

- Wall A = 4.175m^2 [1 mark]
  = 4.175 x 10.76 [1 mark]
  = 44.92 ft^2 [1 mark]
- Wall B = 7.26m^2 [1 mark]
  = 7.26m^2 x 10.76 [1 mark]
  = 78.11 ft^2 [1 mark]
- Wall C = 6.82m^2 [1 mark]
  = 6.82 x 10.76 [1 mark]
  = 73.38 ft^2 [1 mark]
- Wall D = 7.26m^2 [1 mark]
  = 7.26m^2 x 10.76 [1 mark]
  = 78.11 ft^2 [1 mark]

Room 2:

- Wall A = 3.16 m^2 [1 mark]
  = 3.16 x 10.76 [1 mark]
  = 34.0016ft^2 [1 mark]
- Wall B = 7.7m^2 [1 mark]
  = 7.7 x 10.76 [1 mark]
  = 82.85 ft^2 [1 mark]

- Wall C = 7.48 m^2 [1 mark]
  = 7.48 x 10.76 [1 mark]
  = 80.48ft^2 [1 mark]
-
- Wall D = 7.7m^2 [1 mark]
  = 7.7 x 10.76 [1 mark]
  = 82.85 ft^2 [1 mark]

Room 3:

- Wall A = 4.1775m^2 [1 mark]
  = 4.1775 x 10.76 [1 mark]
  = 44.95 ft^2 [1 mark]

- Wall B = 6.67m^2 [1 mark]
  = 6.67 x 10.76 [1 mark]
  = 71.77 ft^2 [1 mark]

- Wall C = 7.015m^2 [1 mark]
  = 7.015 x 10.76 [1 mark]
  = 75.48 ft^2 [1 mark]

- Wall D = 6.67m^2 [1 mark]
  = 6.67 x 10.76 [1 mark]
  = 71.77 ft^2 [1 mark]

Room 4:

- Wall A = 4.17m^2 [1 mark]
  = 4.17 x 10.76 [1 mark]
  = 44.87ft^2 [1 mark]

- Wall B = 6.71m^2 [1 mark]
  = 6.71 x 10.76 [1 mark]
  = 72.20 ft^2 [1 mark]

- Wall C = 6.93m^2 [1 mark]
  = 6.93 x 10.76 [1 mark]
  = 74.57 ft^2

- Wall D = 6.71m^2 [1 mark]
  = 6.71 x 10.76 [1 mark]
  = 72.20 ft^2 [1 mark]

Room 5:

- Wall A = 4.3375m^2 [1 mark]
  = 4.3375 x 10.76 [1 mark]
  = 47.08ft^2 [1 mark]

- Wall B = 6.525m^2 [1 mark]
  = 6.525 x 10.76 [1 mark]
  = 72.21 ft^2 [1 mark]

- Wall C = 7.2m^2 [1 mark]
  = 7.2 x 10.76 [1 mark]
  = 77.47ft^2 [1 mark]

- Wall D = 6.525m^2 [1 mark]
  = 6.525 x 10.76 [1 mark]
  = 72.21 ft^2 [1 mark]