Model Answers
Section C

Section A.

1. $3x^2 - 7x + 4$
   $3x^2 - 3x - 4x + 4$
   $3x(x-1) - 4(x - 1)$
   $(x - 1)(3x - 4)$

2. The perimeter
   = 37 + 24 + 23 + 16) cm
   = 100cm

3. Circumference of the circle π d = $\frac{22}{7}$ x 14
   = 44

4. The gradient of the line segment

   AB = $\frac{y_2 - y_2}{x_2 - y_2}$
   = $\frac{7 - 1}{3 - 0} = \frac{3}{3} = 1$

5. The number of ways = 8_{C_3}
   = $\frac{8 \ x \ 7 \ x \ 6}{3 \ x \ 2 \ x \ 1}$
   = 8 x 7
   = 56 ways

6. x = 7 and 2y = 4 => y = 2

X = 7, y = 2

7. (a). $Cos135 = -Cos(180^0 - 135^0) = Cos\ 45^0 = -\frac{1}{\sqrt{2}}$

(b). $Sin300^0 = -Sin60 = \frac{\sqrt{0}}{2}$

8. (a). $\lim_{n \to \infty}$ (3x + 15) = 3 x 1 + 15 = 3 + 15 = 18

(b). $y = x^2 - 4x$

$\frac{dy}{dx} = 2x - 4$

9. (a). $7^3 + 7^2 + 7^4 = 7^{3+2+4}$

(b). $(3^4)^2 = 3^{4+2} = 3^8$

10. x + 3 > 10

Add -3 to both sides

X + 3 – 3 > 10 – 3

X > 7

Section B.

11. (a). Area of a triangle

$= \frac{1}{2}$ x base x height

(b). Given base = 10cm, height = 3cm

$= \frac{1}{2}$ x 10 x 3

$= 15cm^2$

12. (a). The given coordinates are

y_1, y_2, y_3, y_4, y_5, and y_6.

Using the formula for the area of trapezium, The area $= \frac{1}{2}$ h(a + b)

Total Area

$= \frac{1}{2} h[(y6 + y1) + 2(y2, y3, y4, y5,)]$

(b). let a = 4cm, b = 6cm and h = 3cm

Using A $= \frac{1}{2}$ h(a + b)

$= \frac{1}{2}$ 3(4 + 6)

$\frac{1}{2}$ 3 x 10

A = 15cm

13. (a). $y = x^3 - 3x^2$

$\frac{dy}{dx} = 3x^2 - 6x = 0$

3x(x – 2) = 0

Either, 3x = 0 or x – 2 = 0,

∴ x = 0, or x = 0, when x = 0, y = 0,

when x = 2, $y = 2^3 - 3(2)^2 = 8 - 12 = -14$

The stationary points are (0,0) and (2, -4)

(b). $\frac{dy}{dx} = 6x - 6$

When, x = 0, $\frac{d^2y}{dx} = 6 \times 0 - 6, = -6$

When x = 2, $\frac{d^2y}{dx} = 6 \times 2 - 6 = 6$

∴ (0,0) is a maximum point and (2, -4) is a minimum point.

14. Given the domain -4, -2, -1, 0, 2, 3 and the mapping x ⟶ x + 3

Domain	X + 3	Range
-4	-4 + 3	-1
-2	-2 + 3	1
-1	-1 + 3	2
0	0 + 3	3
2	2 + 2	5
3	3 + 3	6

15. (a).

Masses(kg)	20 -25	26 - 37	32 - 37	38 - 43
Frequency	10	5	20	5
Class mid value	22.5	28.5	34.5	40.5

∈fx (22.5 x 10 + 28.5 x 5 + 34.5 x 20 + 40.5 + 5

∈fx = 225 + 142.5 + 690 + 202.5

∈fx = 1260

∈f = 40

Mean = $\frac{Efx}{Ef} = \frac{1260}{40} = 31.5$

(b). Median order = $\frac{N}{2}$, Where N= Ef = 40

Median order (position) = $\frac{40}{2} = 20$

Median class = 32 - 37

16. (a). x^3 -2x-2 + 5x + 1

$\frac{dy}{dx} = 3x^2 - 4x + 5$

(b). (i). The gradient $\frac{dy}{dx\ (x+)}$

$= 3(0)^2 - 4(0) + 5 = 5$

(ii). The gradient $\frac{dy}{dx\ (x=-1)}$

$= 3(-1)^2 - 4(-1) + 5 = 12$

17. The boundary lines are:

X = 4 (solid line), y = -3(solid line) and

3x + 2y = 6(solid line)

The points for 3x + 2y = 6 are, (0,3) and (2,0)