2. Linear

1	(0,3), (3,0) $\frac{3-0}{0-3}=-1$ $\frac{y-0}{x-3}=-1 \quad y=-x+3$ $y<-x+3$ $x\geq 1$ $y\geq 0$	 B_1 B_1 B_1	
2.	(a) $x \geq -4$ (b) $y = -x$ $y + x \leq 0$ (c) Grad = $\frac{0-^{-}9}{8-^{-}9}$ = ¾ $y = mx + c$ $0 = ¾ (8) + c$ $c = -6$ $y = ¾ x – 6$ $y – ¾ x > -6$	B1 B1 M1 M1	
		04	
3.	$2x + 3 \geq 5x – 3$ $-3x \geq -6$ $x \leq 2$ $5x – 3 > -8$ $5x > -5$ $x > -1$ $-1 < x \leq 2$ Integral values 0,. 1, 2	 B1 B1 B1	
		03	
4.	a) $4x – 9 < 6 + x$ $x < 5$ $8 – 3x < x + 4$ $1 < x$	 M1 M1	

	b) $1 < x < 5$	A1	
5.	$-2x+1 < x-5$ $-3x < -6$ $x > 2$ $x-5 < 5-x$ $2x < 10$ $x < 5$ $\therefore 2 < x < 5$	M_1 $\frac{A_1}{2}$	
7	$-3x + 2 < x + 6$ $x > 1$ $x + 6 \leq 17 - 2x$ $x \leq 3\frac{2}{3}$ 2, 3	B_1 B_1 B_1 3	
8.	$\frac{3a+2}{4} \leq \frac{2a+3}{5} \leq \frac{4a+15}{6}$ $\frac{3a+2}{4} \leq \frac{2a+3}{5}$ $5(3a+2) \leq 4(2a+3)$ $15a + 10 \leq 8a + 12$ $7a \leq 2$ $a \leq 0.2857$ $\frac{2a+3}{5} \leq \frac{4a+15}{6}$ $6(2a + 3) \leq 5(4a + 15)$ $-8a/-8 \leq 57/-8$ $a \leq -7.125$; $-7.125 \leq a \leq 0.28$ Integral values -7, -6, -5, -4, -3, -2, -1	1 M1 B1 B1	
		03	

9. $\frac{1}{2}x - 2 \leq 3 - 2$; $3x - 2 < + \frac{1}{2}x$

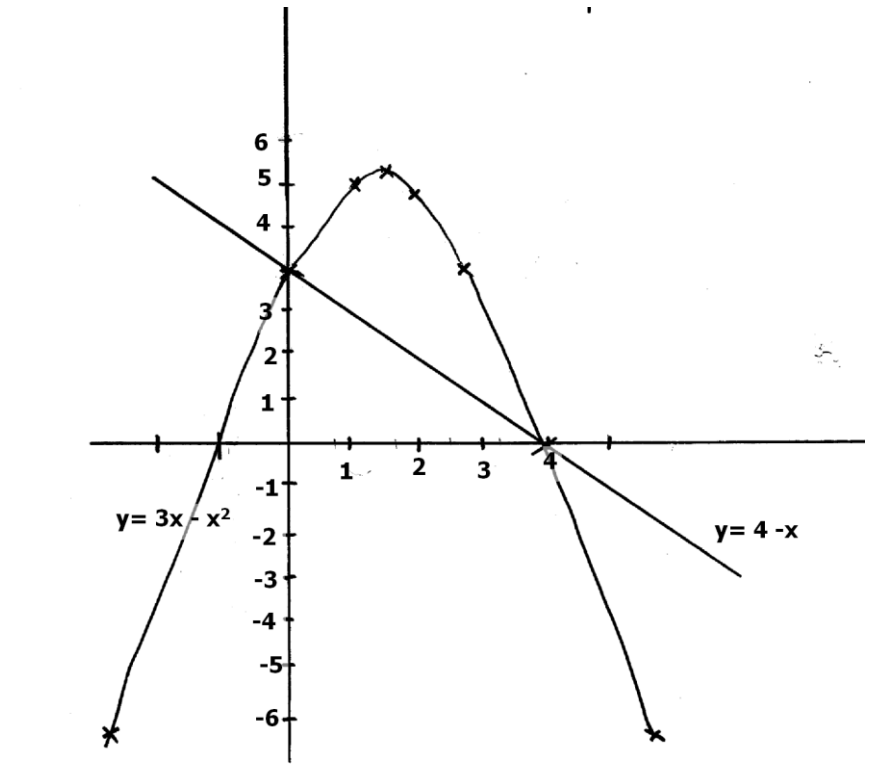
$O \leq {}^{7}/_{2}x$ ${}^{5}/_{2}x < 4$

$O \leq x$ - B1 $x < {}^{8}/_{5}$ B1

$x = 0, 1$ A1

3

10.	$y \leq 2$, $x > -3$ (3,-3) & (-3,1)		

	M = $\frac{1+3}{-3-3} = \frac{4}{-6} = \frac{-2}{3}$ $y = -\frac{2}{3}x + c$ $-3 = \frac{-2}{3} \times 3 + c$ $-3 = -2+c$ $c = -1$ $y = \frac{1}{3}x - 2$, inequality $y < \frac{1}{3}x - 2$ Equn $y = -\frac{2}{3}x - 1$ (3,-3) & (4,2) $M = \frac{2--3}{4-3} = \frac{5}{1} = 5$ Equn $y > -\frac{2}{3}x - 1$ $Y = 5x + c$ $-3 = 5(3) + c$ $-3 - 15 = c$ $C = -18$ $Y = 5x - 18$ inequality $y \geq 5x - 18$	B1 B1 B1	Both B0 if any one is wrong For ✓ Ineq
		03	
11.	$-4x + 2y \leq 4$ $y \geq 0$ $x + y \leq 4$	**B1** **B1** **B1**	
		03	
12.	$3y + 2x \angle 6$ $4y - 3x \geq -12$ $y + 3x \geq -3$	**B1** **B1** **B1**	
		03	
13.	<table><tr><td>X</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>1.5</td></tr><tr><td>Y</td><td>-6</td><td>0</td><td>4</td><td>6</td><td>6</td><td>4</td><td>0</td><td>-6</td><td>6.255</td></tr></table>  b) turning point 1.5, 6.25	**B2** **S1** **P1** **C1** **L1**	For all values ✓

	c) i) Line y = 0 x = -1 or x = 4 x = -1 or x = 4 ii) $4 + 3x - x^2 = y$ $\frac{4x - x^2 = 0}{4 - x = y}$ x = 0 or x = 4	**B1** **B1** **B1** **B1**	
		10	

14	$\frac{2x}{3} + \frac{3x}{4} \le 9.5 + 5.5$ $\frac{8x + 9x}{12} \le 15$ $17x \ge 180$ $x \le \frac{180}{17}$ $-\frac{x}{3} - \frac{3x}{4} < 18 - 9.5$ $\frac{-4x - 9x}{12} < 8.5$ $-\frac{13x}{12} < \frac{17}{2}$ $-13x < 102$ $x > -\frac{102}{13}$ $-\frac{102}{13} < x \le \frac{180}{17}$ $-7\frac{11}{13} < x \le 10\frac{10}{17}$	M1 M1 A1	
		3marks	

15. The diagram below shows the graphs of
$Y = \frac{3}{10}x - \frac{3}{2}$, $5x + 6y = 30$ and $x = 2$
By shading the unwanted region, determine and label the region R that satisfies the three inequalities;

$Y \ge \frac{3}{10}x - \frac{3}{2}$, $5x + 6y \ge 30$ and $x \ge 2$ (2 mks)

L_1 $y = \frac{3}{10}x - \frac{2}{10}$ at (0, 0)

$0 \geq 2$ *

Picking P(0,0)

$0 \geq -\frac{3}{2}$

L_2 $5x + 6y = 30$

At (0, 0) $5x + 6y \geq 30$

$0 \geq 30$ *

16. $7s + 3t = 2950$ ……(i) x 5

$3s + 5t = 2750$ ……(ii) x 3

$35s + 15t = 14750$

$9s + 15t = 8250$

$26s = 6500$

$s = 250$

$t = \frac{2750 - 3(250)}{5} = 400$

$2t + 2s = 2(400) + 2(250)$

= shs. 1,300

17. Let the cost of a biro be b

Pencil be p

$2b + 5p = 120$ x 3

$3b + 2p = 114$ x 2

$6b + 15p = 360$

$6b + 4p = 228$

$11p = 132$

$P = 121$

$2b + 60 = 120$

$2b = 60$

$b = 30$

∴The cost of 1 biro is 30/=

The cost of 1 pencil is 12/=

18. Let son's present age be n yrs

Father's age is 2n yrs

Ten years ago: son's age $\Rightarrow n - 10$

Father's age $\Rightarrow 2n - 10$

Son's present age = 30yrs

Father's present age = 2x 30 = 60yrs

19. $2x + 21 > 15 - 2x$ $\qquad$ $15 - 2x \geq x + 6$

$4x > 0.6$ $\qquad$ $-3x \geq -9$

$x > -1\frac{1}{2}$ $\qquad$ $x \leq 3$

$\Rightarrow -1\frac{1}{2} < x \leq 3$

Values are -1, 0, 1, 2, 3.

20. $y = -2x + 4$

gradient of h line is ½

Equation $\frac{y+4}{x+1} = \frac{1}{2}$

$2y + 8 = x + 1$

$2y - x + 7 = 0$

21. $2s + 3t = 1750$

$3s + 2t = 1500$

$4s + 6t = 3500$ $\qquad 2t = 1500 - 600$

$9s + 6t = 4500$ $\qquad t = 450$

$5s = 1000$

$s = 200$

Shirt = sh 200

Trouser = sh 450

22. *Let r = 3.818181…*

$100r = 381.818181$

$99r = \frac{378}{99} = \frac{42}{11}$

$= 3\frac{9}{11}$

23. *(a)* *Let cost of pencils be x and biro pens to be y*

$4x + 6y = 66$

$2x + 5y = 51$

$4x + 6y = 66$

$4x + 10y = 102$

$4y = 96$

$y = 24$

Correct substitution

$\therefore x = 3$

Pencils = shs.9

Biro pens = 3

(b) $9p + 3b = 228$...(i)

$b - y = 4$

$b = 4 + r$ .....(ii)

substituting for b in .....(i)

$p^2 + 5p - 288 = 0$

$$p = \frac{-5 \pm \sqrt{25 - 4 \times 1 \times -228}}{2 \times 1}$$

P = 13 (to the nearest whole no.)

$b = 4 + 13 = 17$

24. $3x - 2(x + 2) = 21$

$X = 25$

Large No = 25 + 2 = 27

∴ product = 25 x 27 = 695

25. $x - 20 + 3x = 180^oC$

$4x = 200$

$x = 50^o$

Attempt to get x by using $\iota + e = 180^o$

$$e = \frac{(2n-4)90}{n}$$

number of sides

26. $5x + 4y = 6160$

$\underline{4(3x + y = 2800}$

$-7x = -5040$

$x = 720$

$y = 640$

$4(720) + 2(640) = 4160$

27. $2x + 3y = 390$

$5x + 2y = 810$

$15x + 6y = 2430$

$\underline{4x + 6y = 780}$

$11x = 1650$

$x = 150$

A pair of trouser =sh150

A shirt = sh30