

Q1

(a) (i) $\frac{1}{2} \downarrow \frac{1}{2}$ (2m)

(ii) $(-\infty, 0)$ (2m)

(b) (i) $\frac{1}{4}$ (2m)

(ii) -3 (2m)

(c) $5(x + 3(1-x) + 2) \geq 5$

$5(x + 3 - 3x + 2) \geq 5$

$5(-2x + 5) \geq 5$

$-10x + 25 \geq 5$

$-10x \geq -20$

$x \leq \frac{-20}{-10}$

$x \leq 2$

(2m)

wrong answer
max $1\frac{1}{2}$.

Q2
(a) (i) $2^{\frac{1}{2}} \times 4^{\frac{3}{2}}$
 $= 2^{\frac{1}{2}} \times (2^2)^{\frac{3}{2}}$
 $= 2^{\frac{1}{2}} \times 2^3$
 $= 2^{\frac{1}{2}+3}$
 $= 2^{\frac{7}{2}}$

1m.
1m.

~~2~~

(ii) $256^{2x-3} \times 16^{1-x}$
 $= (2^8)^{2x-3} \times (2^4)^{1-x}$
 $= 2^{16x-24+4-4x}$
 $= 2^{12x-20}$

4 marks

$(16)^{2x-3} \times 16^{1-x}$
 $= 16^{4x-6} \times 16^{1-x}$
 $= 16^{4x-6+1-x}$
 $= 16^{3x-5}$
 $= (2^4)^{3x-5}$
 $= 2^{12x-20}$

full correct
3½ marks.

½ marks.

4 6x-10

(b) (i) $9^x = 27$
 $3^{2x} = 3^3$

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

$x = \frac{3}{2}$ (2 marks).

(ii) $2^{2n} = 16^{-\frac{3}{4}} \times \left(\frac{1}{4}\right)^{-2}$
 $2^{2n} = (2^4)^{-\frac{3}{4}} \times (2^{-2})^{-2}$
 $2^{2n} = 2^{-3} \times 2^4$
 $2^{2n} = 2^{-3+4}$
 $2n = -3+4$

$\frac{2n}{2} = \frac{1}{2}$

$n = \frac{1}{2}$

(2 marks).