Year 10 Assessment Task 2 Solutions

Question 1

(a) (A) (i) Function ✓

(ii) D: $-3 \le x \le 3$ ✓

R: $0 \le y \le 3$ ✓ ③

(B) (i) Relation ✓

(ii) D: $x \le 2$ ✓

R: all real y ✓ ③

(b) $g(x) = 3x^2 - 7x + 1$

$3k^2 - 7k + 1 = 7$

$3k^2 - 7k - 6 = 0$

$(3k+2)(k-3) = 0$ ✓

$k = -\frac{2}{3}$ or 3 ✓ ②

(c) (i) $f(-3) = (-3)^2 - 6(-3) - 7$

$= 9 + 18 - 7$

$= 20$ ✓ ✓ ①

(ii) $f(p+1) = (p+1)^2 - 6(p+1) - 7$ ✓

$= p^2 + 2p + 1 - 6p - 6 - 7$

$= p^2 - 4p - 12$ ✓ ②

(iii) Axis of symmetry:

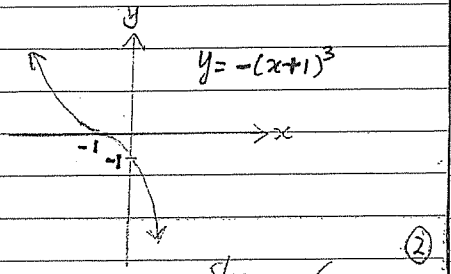
$x = \frac{6}{2}$

$= 3$ ✓

$y = -16$

$\therefore$ range is $y \ge -16$ ✓ ②

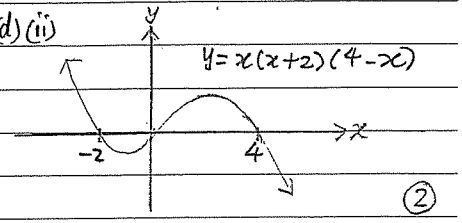
(d) (i)



Shape ✓

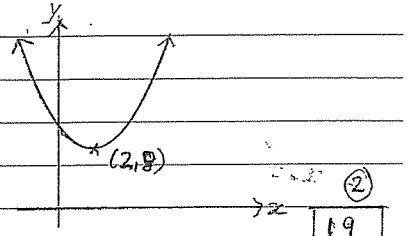
x & y intercepts labeled ✓ ②

(d) (ii)



②

(e)



②

19

Question 2

(a) $3x^2 - 6x + 1 = 0$

$x = \frac{6 \pm \sqrt{36 - 12}}{6}$ ✓

$= \frac{6 \pm \sqrt{24}}{6}$

$= \frac{6 \pm 2\sqrt{6}}{6}$ ✓

$= \frac{3 \pm \sqrt{6}}{3}$ ✓ ③

(b) $y = a(x-2)(x-4)$ ✓

Sub $(1, -6)$

$-6 = a(1-2)(1-4)$

$-6 = 3a$

$a = -2$ ✓

$\therefore y = -2(x-2)(x-4)$

$= -2(x^2 - 6x + 8)$

$= -2x^2 + 12x - 16$ ✓ ③

(b) Alt $y = a(x+2)(x-4)$ ✓

Sub $(1, -6)$

$-6 = a(3)(-3)$

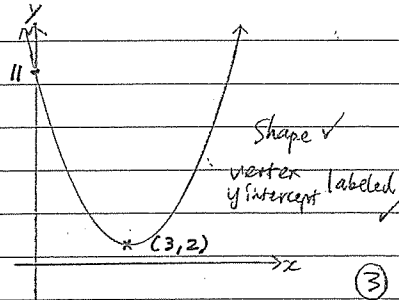
$a = \frac{2}{3}$ ✓

$y = \frac{2}{3}x^2 - \frac{4}{3}x - \frac{16}{3}$ ✓

Q 2 (cont)

(c) $y = x^2 - 6x + 11$

$= (x-3)^2 + 2$ ✓



Shape ✓

vertex & y intercept labeled ✓ ③

(d) $x + 2y = 3$ —①

$xy + 2x + y = 4$ —②

From ①,

$x = 3 - 2y$ ✓

Sub into ②,

$y(3-2y) + 2(3-2y) + y = 4$ ✓

$3y - 2y^2 + 6 - 4y + y - 4 = 0$

$2y^2 = 2$

$y = \pm 1$

Sub into ①,

$\therefore x = 1, y = 1$ ✓

or $x = 5, y = -1$ ✓ ③

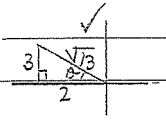
12

Question 3

(a) $\cos(-225^\circ) = -\cos 45^\circ$ ✓

$= -\frac{1}{\sqrt{2}}$ ✓ ②

(b) $\sin\theta = \frac{3}{\sqrt{13}}$ ✓



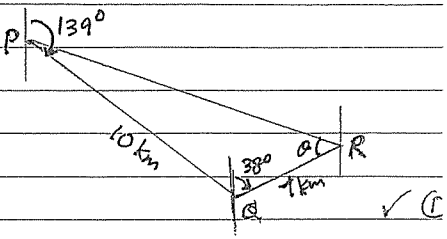
✓ ②

(c) $\sin\theta = \frac{\sqrt{3}}{2}$

$\theta = 60^\circ, 120^\circ$

✓ ✓ ②

(d) (i)



✓ ①

(ii) $\angle PQR = 41^\circ + 38^\circ$ ✓ ①

$= 79^\circ$

(iii) $PR^2 = 10^2 + 7^2 - 2 \times 10 \times 7 \cos 79^\circ$ ✓

$= 122.2867\ldots$

$PR \doteq 11.06$ km ✓ ②

(iv) Let $PRQ = \theta$

$\frac{\sin\theta}{10} = \frac{\sin 79^\circ}{11.06}$ ✓

$\sin\theta = \frac{10 \sin 79^\circ}{11.06}$

$\theta \doteq 63^\circ$ ✓

$\therefore$ bearing $= 180^\circ + 38^\circ + 63^\circ$

$= 281^\circ T$ ✓ ③

13

Question 4

(a) (i) $P = -6x^2 + 60x - 54$

$= -6(x^2 - 10x + 9)$

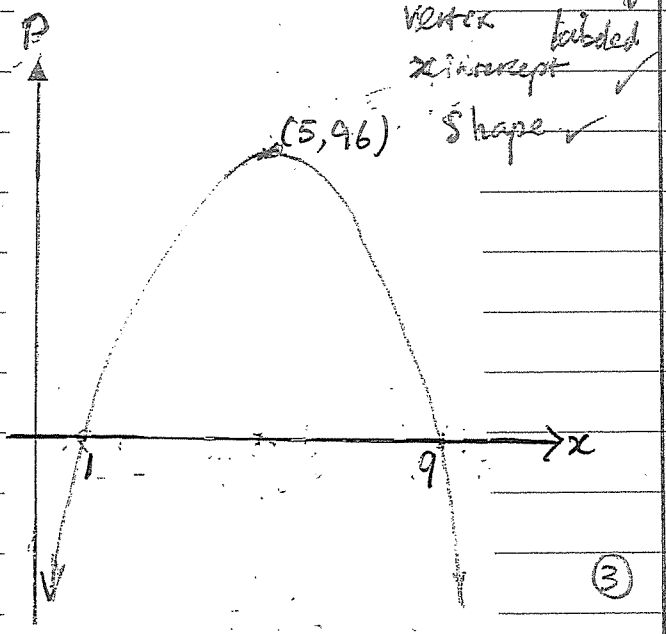
$= -6(x-9)(x-1)$

Axis of symmetry:

$x = \frac{1+9}{2}$

$= 5$

$y = 96$



(3)

(ii) 101 phone cases ✓ (1)

(iii) 500 phone cases ✓ (1)

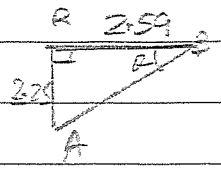
(b) (i) $\tan 43^\circ = \frac{2.1}{RA}$

$RA \doteqdot 2.25\text{m}$ ✓

$\tan 39^\circ = \frac{2.1}{RB}$

$RB \doteqdot 2.59\text{m}$ ✓ (2)

(ii)



$\tan\theta = \frac{2.25}{2.59}$ ✓

$\theta \doteqdot 41^\circ$ ✓ (2)

(iii) $AB^2 = (2.25)^2 + (2.59)^2$ ✓

$\doteqdot 3.4\text{m}$ ✓ (2)

11