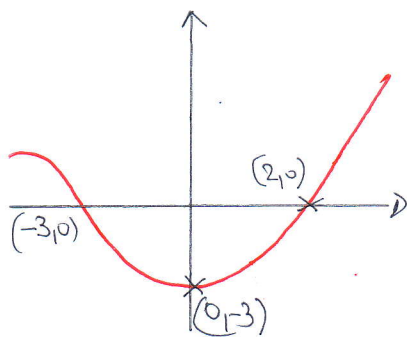


1. a)

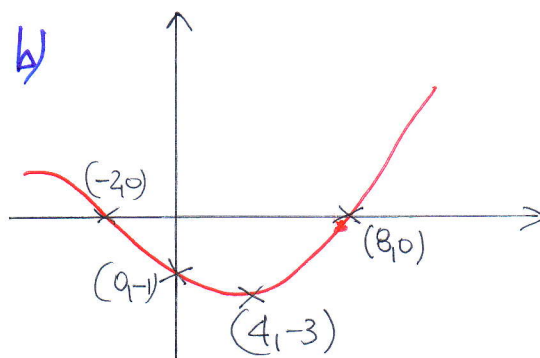


B1 CORRECT SHAPE IN CORRECT QUADRANTS

B1 MIN AT (0, -3)

B1 (-3, 0) & (2, 0) BOTH

b)



dep → CORRECT SHAPE IN CORRECT QUADRANTS

A2 ALL FOUR CORRECT CO-ORDINATES
(-2, 0), (8, 0), (0, -1), (4, -3)

-1 c.e.o

2.

$$\frac{(1+\sqrt{7})(3+\sqrt{7})}{(3-\sqrt{7})(3+\sqrt{7})} \text{ OR } \frac{(8-\sqrt{7})(\sqrt{7}+2)}{(\sqrt{7}-2)(\sqrt{7}+2)}$$

B1

$$\frac{10 + 4\sqrt{7}}{2}, \frac{6\sqrt{7} + 9}{3}$$

A2

$$5 + 2\sqrt{7} - (2\sqrt{7} + 3)$$

M1 DO NOT AWARD IF 'INVISIBLE' BRACKET

2

A1 c.a.o

3.

a) $8x + 12 + 2 > 47 - 5x$ OR $14x > 35$

M1

$$x > \frac{5}{2} \text{ O.E.}$$

A1

b)

5 & $-\frac{1}{2}$ SEEN OR IMPLIED

M1



M1

$$x \leq -\frac{1}{2} \text{ OR } x \geq 5 \text{ C.A.O.}$$

A1 dep

accept "and"
do not accept $>$
do not accept $5 \geq x \geq -\frac{1}{2}$

c) $x \geq 5$ A1 C.A.O

4.
$$-\frac{50}{2}[(173) - (170)] - 113 - \frac{50}{2}[2 \times (173) + 49(-7)]$$

$$75 \quad \quad \quad -113 - 75$$

AWARD 1 MARK IF NO MARK IS SCORED & $173 + 165 + 159 + \dots$ IS SEEN

5. a) GOOD SUBSTITUTION ATTEMPT

$$2x^2 - 5x + 10 = 0$$

$$(-5)^2 - 4 \times 2 \times 10$$

$$25 - 80 < 0$$

$$\text{or } -55 < 0 \quad + \text{ comment}$$

MI

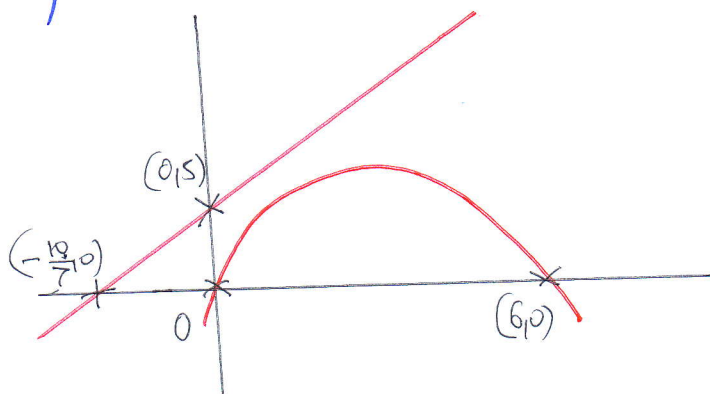
AI

MI

AI

b) (3, 9) BI BI

c)



LINE

THROUGH (0, 5) AI dep

THROUGH $(-\frac{10}{7}, 0)$ AI dep

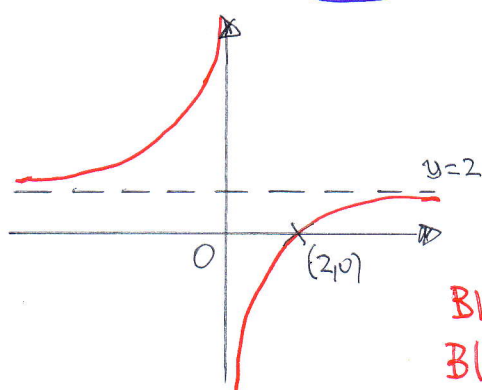
QUADRATIC SHAPE CORRECT

THROUGH (0, 0) AI dep

THROUGH (6, 0) AI dep

1 IF C & L MEET

6. a)



b)

$$y = 2$$

BI

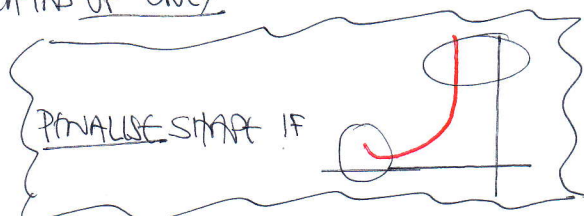
$$x = 0 \text{ OR } y \text{ AXIS}$$

BI

BI SHAPE CORRECT

BI TRANSFORMATION ONLY

BI (2, 0)



$$7. \quad (y =) \int 8\sqrt{x} - 10 \, dx \quad \text{o.e.} \quad \text{B1}$$

$$(y =) 6x^{\frac{4}{3}} - 10x + C \quad \text{o.e.} \quad \text{B3}$$

$$18 = 6 \times 8^{\frac{4}{3}} - 10 \times 8 + C \quad \text{o.e.} \quad \text{M1}$$

$$C = 2 \quad \text{OR} \quad y = 6x^{\frac{4}{3}} - 10x + 2 \quad \text{o.e.} \quad \text{A1}$$

$$8. \quad a) \quad 2p - 5 - (-p) \quad \text{B1}$$

$$3p - 2 - (-2p - 5) \quad \text{B1}$$

$$3p - 5 = p + 3 \quad \text{M1}$$

$$2p = 8 \quad \text{LEADING TO } p = 4 \quad \text{A1}$$

$$b) \quad \frac{20}{2} [2(-4) + 19 \times 7] \quad \text{M1} \quad \text{correct "use" of formula}$$

A1 All correct

$$1250$$

A1

$$c) \quad -4 + (k-1) \times 7 > 1000$$

Allow use of n

Allow use of $=$ OR \geq

M1

$$7k > 1011 \quad \text{OR} \quad 7k = 1011 \quad \text{M1}$$

$$k = 145 \quad \text{A1 c.a.o.}$$

9. a)

$$\frac{9-3}{12-0}$$

$$\frac{1}{2}$$

$$y = \frac{1}{2}x + 3 \text{ OR } 2y = x + 6$$

M1

A1 o.e.

A1 o.e.

b)

IMPLICIT OR USES GRAD -2

$$y - 1 = -2(x - 11)$$

GOOD ATTEMPT TO SOLVE EQUATIONS

$$x = 8 \quad y = 8 \text{ OR } (8, 7)$$

B1

M1

M1 ft

A2 c.a.o

c)

$$\sqrt{(7-1)^2 + (8-11)^2} \text{ correct use}$$

$$\sqrt{45} \text{ OR } 3\sqrt{5}$$

M1 ft

A1 ft

d)

$$|AP| = \sqrt{(7-3)^2 + (8-0)^2}$$

$$|AP| = \sqrt{80} \text{ OR } 4\sqrt{5}$$

$$\frac{1}{2} \times 4\sqrt{5} \times 3\sqrt{5} = 30$$

M1

A1

A1 CONVINCING ATTEMPT

10% a)

SUBSTITUTION ATTEMPT — M1 —

$$4x^2 - 11x + 6 = 0 \text{ — A1 —}$$

$$(4x-3)(x-2) \text{ — M1 —}$$

$$x = \frac{2}{3} \text{ — A1 —}$$

$$(2, 1) \text{ \& } \left(\frac{3}{4}, \frac{13}{8}\right) \text{ — A1 both as co-ordinates —}$$

ALTERNATIVE

SUBSTITUTION ATTEMPT

$$8y^2 - 21y + 13 = 0$$

$$(y-1)(8y-13)$$

$$y = \frac{1}{8}$$

$$(2, 1) \text{ \& } \left(\frac{3}{4}, \frac{13}{8}\right)$$

b)

IMPLICIT GRAD OF L IS $-\frac{1}{2}$

B1

$$\frac{dy}{dx} = 4x - 6$$

B1

IMPLICIT GRAD AT $x=2$ IS 2

A1

dep

COMMENT SUCH THAT "NEGATIVE REPLACES", THEREFORE ... E1

c)

$$4x - 6 = -\frac{1}{2} \text{ M1}$$

$$x = \frac{11}{8} \text{ A1 o.e.}$$