



Fortify Sample Exam A

SPECIALIST MATHEMATICS

Exam 2 Solutions

Section A

1	A	11	C
2	C	12	C
3	B	13	A
4	A	14	B
5	D	15	E
6	A	16	B
7	B	17	C
8	A	18	B
9	D	19	D
10	C	20	B

Section B

Question 1a.

$$x > \frac{-1}{2}$$

Question 1b.

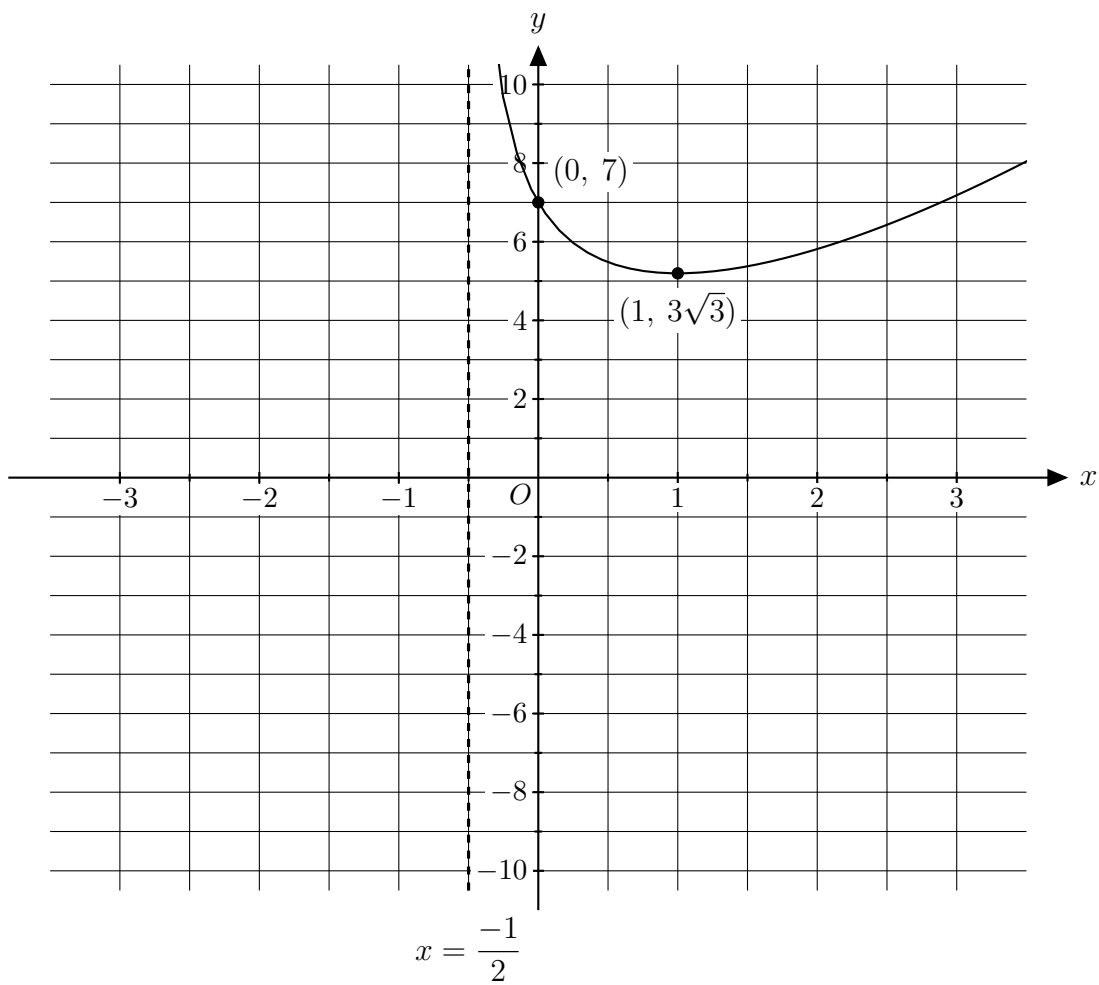
$$f'(x) = \frac{3x^2 + 3x - 6^{\frac{3}{2}}}{(2x + 1)}$$

$(1, 3\sqrt{3})$ is a local minimum.

Question 1c.

$$x = \frac{-1}{2}$$

Question 1d.



Question 1e.

$$\text{length} = \int_0^3 \sqrt{1 + \left(\frac{3x^2 + 3x - 6}{(2x + 1)^{\frac{3}{2}}} \right)^2} dx$$

Question 1f.

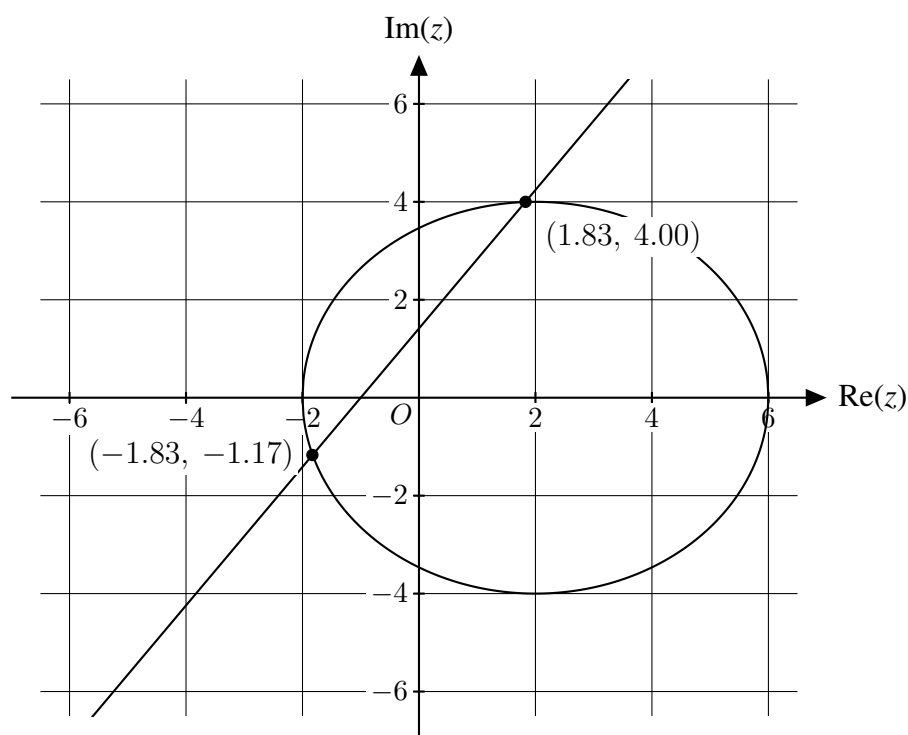
$$V = 325.41 \text{ units}^3$$

Question 2a.

$$y = \sqrt{2}x + \sqrt{2}$$

Question 2b.

$$(-1.83, -1.17) \text{ and } (1.83, 4.00)$$

Question 2c.**Question 2e.**

$$x = 1$$

Question 2f.

$$A = 2\sqrt{2} \text{ units}^2$$

Question 3a.

$t = 5$ seconds

Question 3b.

$s = 122.5$ m

Question 3c.

$a = -1 \text{ ms}^{-2}$

Question 3d.

$d = 69.58$ m

Question 3e.

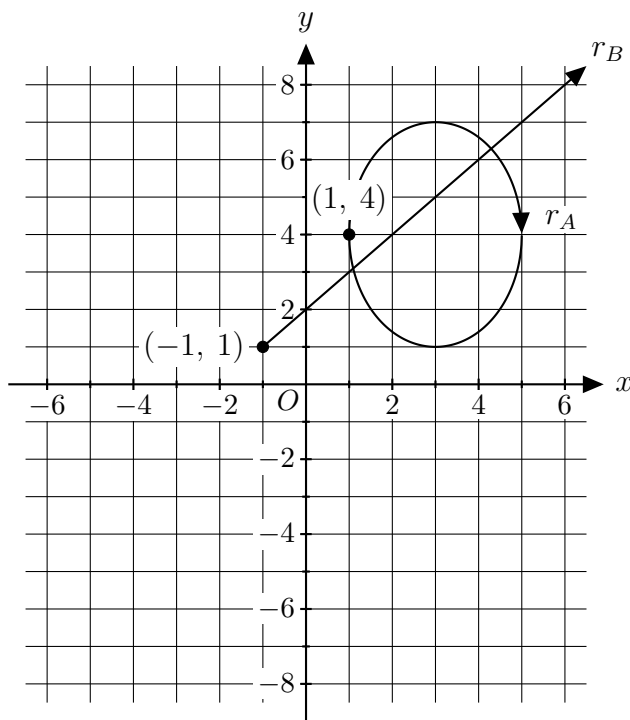
$d = 140.88$ m

Question 4a.

Adam: $\frac{(x - 3)^2}{4} + \frac{(y - 4)^2}{9} = 1$

Beth: $y = x + 2$

Question 4b.



Question 4c.

$(1.09, 3.09)$ and $(4.29, 6.29)$

Question 4d.

After 30 seconds $\left(t = \frac{1}{2}\right)$

Question 4ei.

$d = \sqrt{(-t^2 + t + 2)^2 + 25}$

Question 4eii.

$d = 5$ km

Question 5a.

$h = \frac{(16\pi\sqrt{2} - t)^2}{64\pi^2}$

Question 5b.

$t = 16\pi\sqrt{2}$ minutes

Question 5d.

$h = 1.04$ m

Question 6a.

$\mu = 5, \sigma = 0.125$

Question 6b.

$H_0 : \mu = 5$

$H_1 : \mu > 5$

Question 6c.

$p = \Pr(\mu = 5) = 0.0548$

Question 6d.

$p = 0.0548 > 0.05$, do not reject H_0

Question 6e.

Type II Error

Question 6f.

5.206 minutes