

# ASSIGNMENT TEST 4 SOLUTIONS

1. a)  $\vec{AB} = \begin{pmatrix} 3 \\ 4 \\ -5 \end{pmatrix}$

$$|\vec{AB}| = \sqrt{50} = 5\sqrt{2}$$

$\mu, A,$

b)  $\vec{r} = \begin{pmatrix} 1 \\ -1 \\ 3 \end{pmatrix} + \lambda \begin{pmatrix} 3 \\ 4 \\ -5 \end{pmatrix}$  or  $\vec{r} = \begin{pmatrix} 4 \\ 3 \\ -2 \end{pmatrix} + \lambda \begin{pmatrix} 3 \\ 4 \\ -5 \end{pmatrix}$

$\mu, A,$

c)  $\begin{pmatrix} 6+2\mu \\ 4+\mu \\ -3-\mu \end{pmatrix} = \begin{pmatrix} 4 \\ 3 \\ -2 \end{pmatrix}$

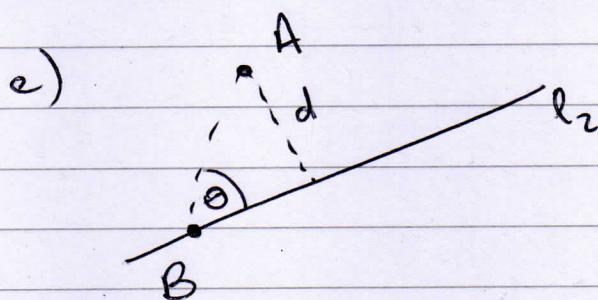
true when  $\mu = -1$

$\mu, A,$

d)  $\cos \theta = \frac{6+4+5}{5\sqrt{2} \sqrt{6}}$

$$\theta = \frac{\pi}{6} \text{ or } 30^\circ$$

$\mu, A, A,$



$$d = |\vec{AB}| \sin \theta$$

$$= 5\sqrt{2} \times \frac{1}{2}$$

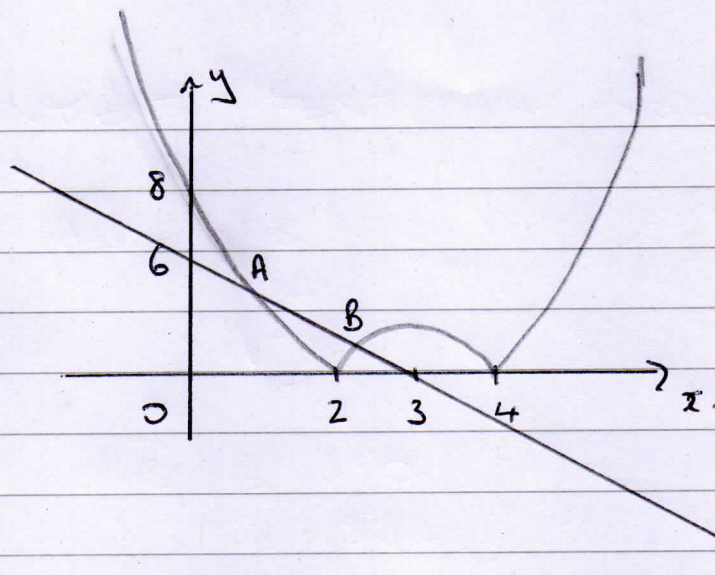
$$= \frac{5\sqrt{2}}{2}$$

$A,$

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2. a)



B, shape

A<sub>2</sub> axes points

b) Point A.

$$(x-2)(x-4) = 6-2x.$$

$$x^2 - 6x + 8 = 6 - 2x.$$

$$x^2 - 4x + 2 = 0.$$

$$x = \frac{4 \pm \sqrt{16-8}}{2}.$$

$$= 2 \pm \sqrt{2}.$$

accept  $x = 2 - \sqrt{2}$ . <sup>A<sub>1</sub></sup> reject  $2 + \sqrt{2}$ . <sup>A<sub>2</sub></sup>

Point B.

$$-(x-2)(x-4) = 6-2x.$$

$$-x^2 + 6x - 8 = 6 - 2x.$$

$$0 = x^2 - 8x + 14$$

$$x = \frac{8 \pm \sqrt{64-56}}{2}$$

$$= 4 \pm \sqrt{2}.$$

accept  $x = 4 - \sqrt{2}$  <sup>A<sub>1</sub></sup> reject  $4 + \sqrt{2}$ .

c)  $2 - \sqrt{2} < x < 4 - \sqrt{2}$

B, B<sub>1</sub>

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$$3. a) \frac{x^2-1}{|x+2|} = 3(1-x)$$

$$x^2-1 = 3(1-x)|x+2|$$

$$x^2-1 = 3(1-x)(x+2) \quad \boxed{\text{OR}} \quad x^2-1 = 3(1-x)(-(x+2))$$

$$x^2-1 = 3x-6x-3x^2+16 \quad \boxed{\text{OR}}$$

$$4x^2+3x-7 = 0$$

$$(4x+7)(x-1) = 0$$

$$x = -\frac{7}{4} \text{ or } x = 1$$

M, A, A,

$$x^2-1 = 3x^2+3x-6$$

$$0 = 2x^2+3x-5$$

$$(2x+5)(x-1) = 0$$

$$x = -\frac{5}{2} \text{ or } x = 1$$

M, A, A,

$$b) \left\{ x : x < -\frac{5}{2} \right\} \cup \left\{ x : -\frac{7}{4} < x < 1 \right\}$$

B, B,

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