

Ching Ka Lam Karen (6) 4C1

Weekend Assignment Wk 9

Date 5/3/05 No.

$$\begin{aligned} 1. (a) \quad BC &= \sqrt{8^2 + 10^2 - 2(8)(10)\cos 47^\circ} \\ &= \sqrt{164 - 160\cos 47^\circ} \\ &= 7.41 \text{ cm (to 3 s.f.) } [7.4081] \end{aligned}$$

$$\begin{aligned} (b) \quad CE &= \sqrt{7.41^2 + 30^2} \\ AE &= \sqrt{10^2 + 30^2} \end{aligned}$$

$$\begin{aligned} 8^2 &= CE^2 + AE^2 - 2(CE)(AE)\cos \hat{CEA} \\ 2(CE)(AE)\cos \hat{CEA} &= (CE^2 + AE^2) - 64 \\ \cos \hat{CEA} &= \frac{(CE^2 + AE^2) - 64}{2(CE)(AE)} \end{aligned}$$

$$\begin{aligned} \hat{CEA} &= \cos^{-1} \left[\frac{(CE^2 + AE^2) - 64}{2(CE)(AE)} \right] \\ &= 14.6^\circ \text{ (to 1 d.p.)} \end{aligned}$$

$$\therefore \angle CEA = 14.6^\circ$$

$$(c) \quad \text{Length of midpt AD} = 30 \div 2 = 15 \text{ cm.}$$

$$\begin{aligned} BP &= EP = \sqrt{10^2 + 15^2} \\ &= \sqrt{325} \text{ cm} \end{aligned}$$

$$\begin{aligned} 30^2 &= (\sqrt{325})^2 + (\sqrt{325})^2 - 2(\sqrt{325})^2 \cos \hat{BPE} \\ 900 &= 650 - 650 \cos \hat{BPE} \end{aligned}$$

$$650 \cos \hat{BPE} = -250$$

$$\cos \hat{BPE} = -\frac{5}{13}$$

$$\hat{BPE} = 112.6^\circ \text{ (to 1 d.p.)}$$

$$\begin{aligned} (d) \quad \text{Area of } \triangle ABC &= \frac{1}{2}(10)(8)\sin 47^\circ \\ &= 29.3 \text{ cm}^2 \text{ (to 3 s.f.)} \end{aligned}$$

13

pen



$$2. (i) \tan \hat{DBE} = \frac{24}{250}$$

$$\hat{DBE} = 5.5^\circ \text{ (to 1 d.p.)}$$

The angle of elevation of E from B is 5.5° .

$$(ii) \tan 5^\circ = \frac{24}{DC}$$

$$DC = 274.32 \text{ m (to 5 s.f.)}$$

$$BC = \sqrt{250^2 + 274.32^2} - 2(250)(274.32)\cos 57^\circ$$

$$= 251 \text{ m (to 3 s.f.)}$$

$$(iii) \angle ABD = (180 - 43 - 37)^\circ$$

$$= 100^\circ$$

$$\frac{AD}{\sin 100^\circ} = \frac{250}{\sin 37^\circ}$$

$$AD = 409 \text{ m (to 3 s.f.)}$$

$$3. (a) \sin 30^\circ = \frac{h}{BC}$$

$$BC = \frac{h}{\sin 30^\circ}$$

$$= 2h //$$

$$\sin 53^\circ = \frac{2h}{AC}$$

$$AC = \frac{2h}{\sin 53^\circ}$$

$$= \frac{2h}{0.8}$$

$$= 2\frac{1}{2}h //$$

$$(b) \sin \hat{CAF} = \frac{h}{2\frac{1}{2}h}$$

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

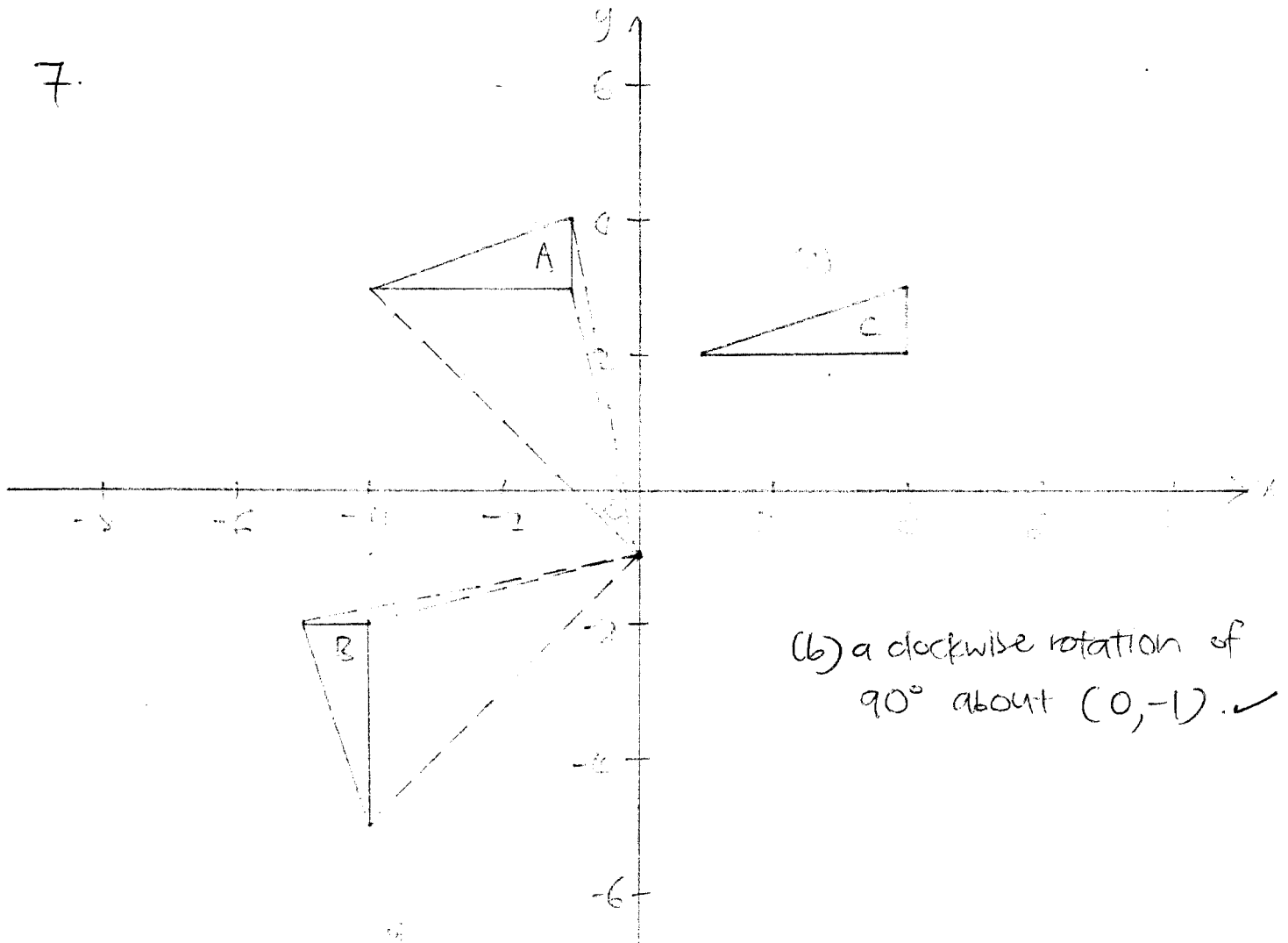
$$AB = \frac{2(12)}{1.33}$$

$$(c) \tan 53^\circ = \frac{2h}{AB}$$

$$AB = \frac{2h}{\tan 53^\circ}$$

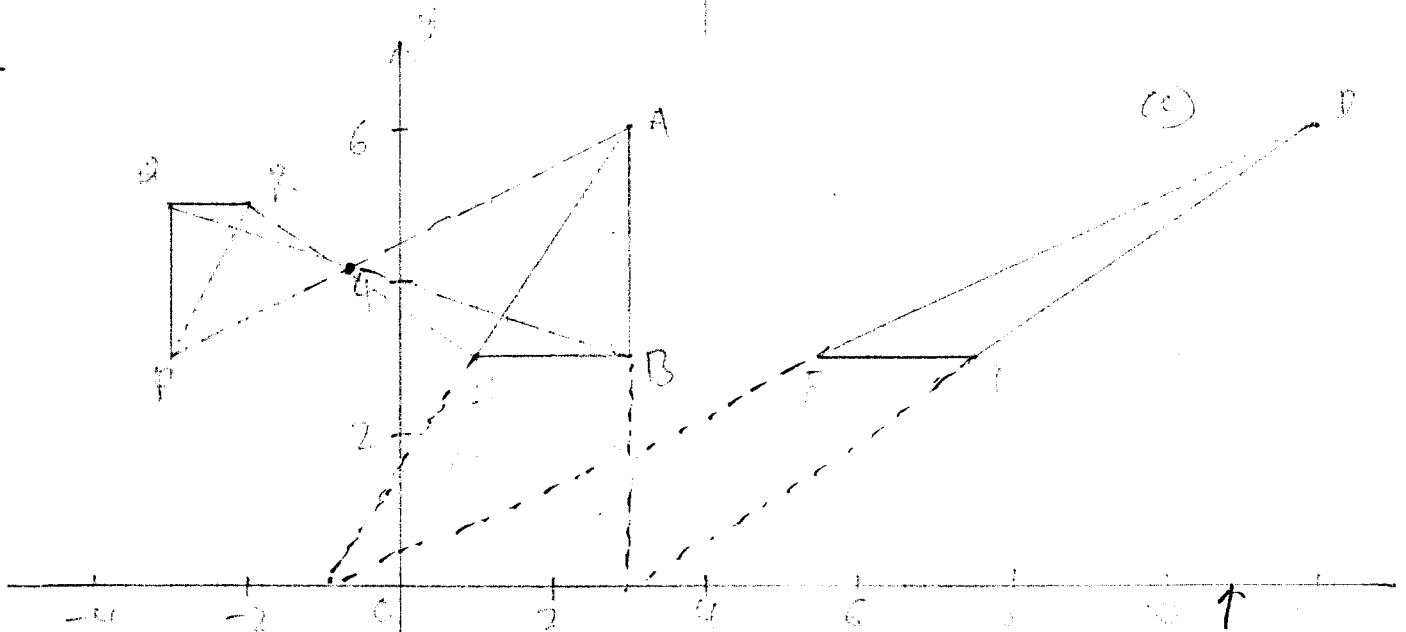
$$= 18.0 \text{ mm (to 3 s.f.)}$$

7.



(b) a clockwise rotation of 90° about $(0, -1)$. ✓

8.



(a) translation $\begin{pmatrix} 9 \\ 0 \end{pmatrix}$

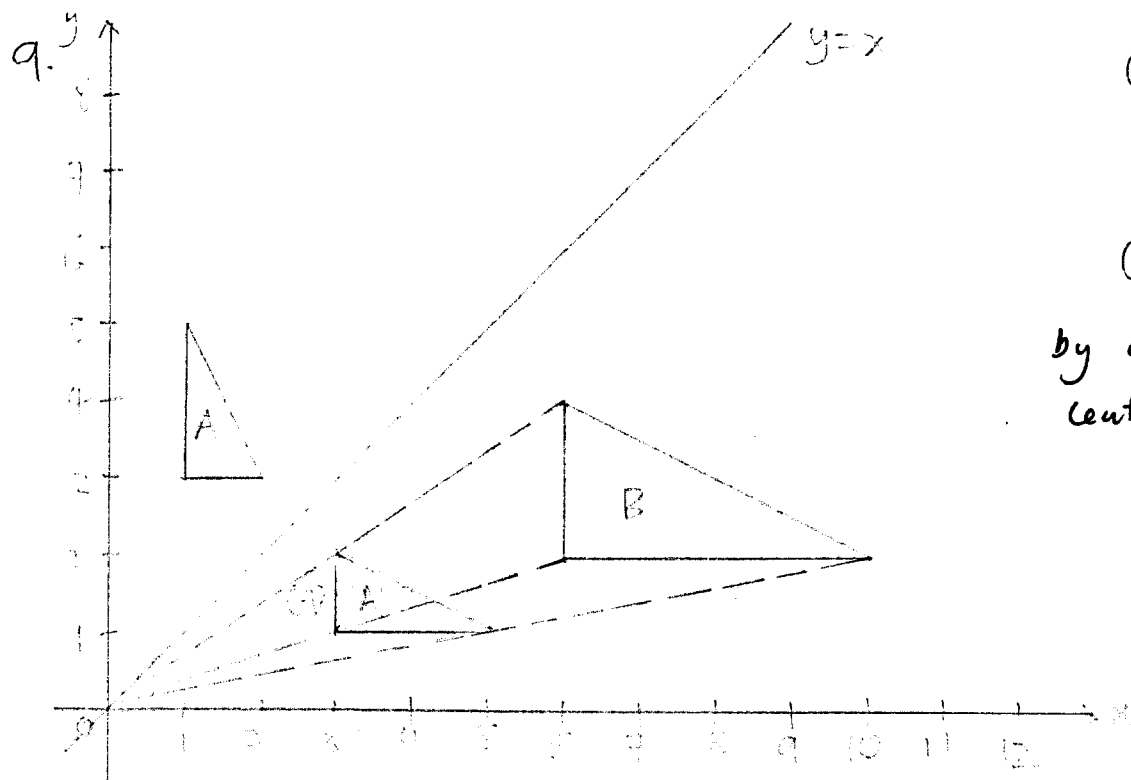
(b) scale factor $= -\frac{1}{2}$

(c), shear factor $= \frac{9}{6}$
Invariant line $= \frac{3}{2}$

ching ka lam karen
TYS Unit 10 paper 1

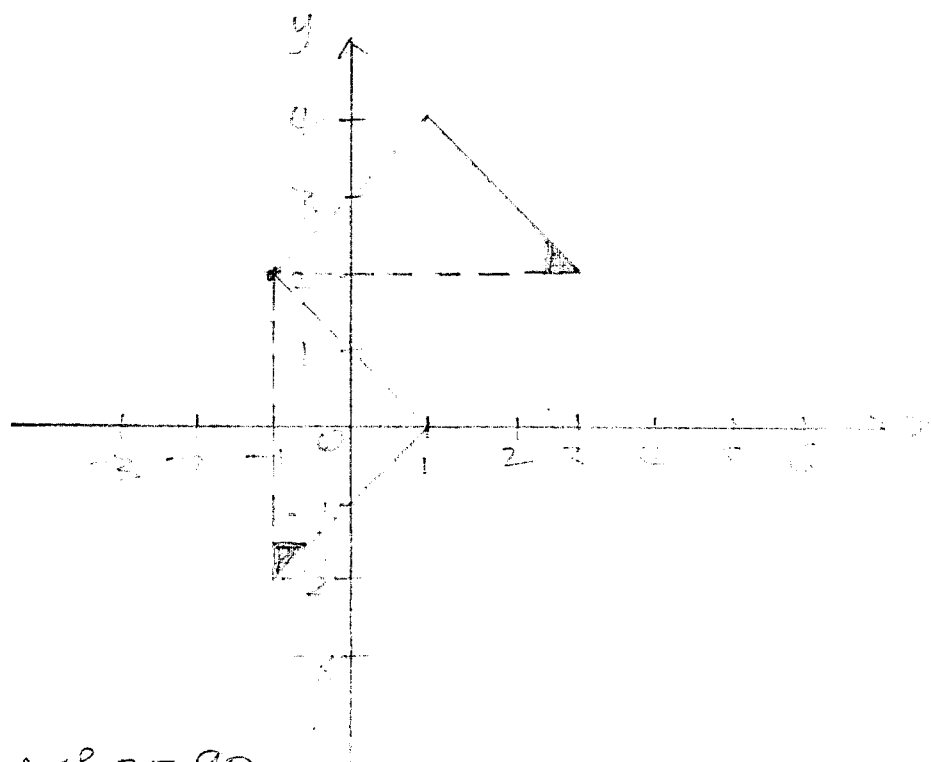
4C1

6
5/3/05



- (b) enlargement at $(0,0)$, scale factor $=2$.
- (c) reflection in line $y=x$ ~~and~~ followed by an enlargement with centre $(0,0)$, scale factor $=2$.

10.



(a) value of $z = 90$

(b) $P(-1,2)$