

MIS 133 EXAM 4B

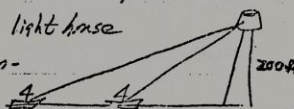
NAME _____

Use TABLE III, Trig sheet only. (No calculators or other tables.)
Show all work on separate paper. Round off angles to nearest $1'$.

1. Solve the right triangle with right angle at C if

(8) $A = 35^\circ 20'$, $c = 100$.

2. A lighthouse is 200 ft above the water. The angle of depression to boat A is $18^\circ 50'$, the angle of depression to boat B is $14^\circ 20'$, the boats being in line. How far are each of the boats from the lighthouse and what is the distance between them.



3. Solve the triangle ABC given

(8) $c = 10$ $A = 47^\circ 50'$ $B = 102^\circ 10'$

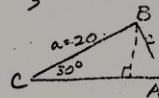
DO NOT (4) In the law of sines A.S.S. problem $\angle C = 30^\circ$, $a = 20$

(3) a) For what value(s) of c will there be exactly one right triangle.

(3) b) For what value(s) of c will there be no triangle formed.

(3) c) For what value(s) of c will there be two solutions?

(8) d) If $\angle C = 30^\circ$, $a = 20$, $c = 15$, solve the triangle (a).



(10) 5. In $\triangle ABC$, $a = 6$ $b = 8$ $c = 5$. Find the largest angle.

6. If the direction angle α of a vector is 120° and $|\vec{v}| = 10$,

(6) find $|\vec{v}_x|$ and $|\vec{v}_y|$.

(6) 7. If $\vec{v} = 3\vec{i} - 3\vec{j}$, find $|\vec{v}|$ and its direction angle α .

(6) 8. If $\vec{v}_1 = 9\vec{i} - 5\vec{j}$, $\vec{v}_2 = 2\vec{j}$, find $\vec{v}_1 \cdot \vec{v}_2$.

(2) 9. a) Determine if $\vec{v}_3 = 9\vec{i} - 6\vec{j}$ and $\vec{v}_4 = 4\vec{i} + 6\vec{j}$ are \perp ?

(2) b) Are $\vec{v}_5 = 3\vec{i} + 2\vec{j}$, $\vec{v}_6 = \vec{i} - \vec{j}$ perpendicular?

(2) c) Are $\vec{v}_7 = 3\vec{i}$, $\vec{v}_8 = -6\vec{j}$ perpendicular?

10. $\vec{v}_1 = (3, -1)$ $\vec{v}_2 = (0, 4)$. Find $\cos \theta$, in simplest radical

(6) form, where θ is angle between \vec{v}_1 and \vec{v}_2 .

(6) 11. Express in $a + bi$ form = $\frac{1 + 7i}{7i}$.

(6) 12. Express $-1 + i$ in polar (trigonometric) form.

(6) 13. Express $6(\cos 300^\circ + i \sin 300^\circ)$ in rectangular form.

(6) 14. Express in the form $a + bi$:

$$\sqrt{5}(\cos 100^\circ + i \sin 100^\circ) \cdot \sqrt{10}(\cos 80^\circ + i \sin 80^\circ)$$

(6) 15. Express in the form $a + bi$:

$$(-1 + \sqrt{3}i)^{10}$$

EXAM 4B - KEY MS 133

1. $B = 54^{\circ}40'$

$a = 57.83$

$t = 81.58$

2. Boat B = 782.8

Boat A = 586.4

distance = 196.4

3. $C = 30^{\circ}$

$t = 19.55$

$a = 14.82$

4 a) when $C = 10$

b) when $C < 10$

c) when $10 < C < 20$

d) $\angle A = 41^{\circ}50'$ $\angle A = 138^{\circ}10'$

$\angle B = 108^{\circ}10'$ $\angle B = 11^{\circ}50'$

$t = 28.5$ $t = 6.2$

5. $\cos \beta = -.05$, $\beta = 92^{\circ}50'$

6. $|\vec{v}_x| = 5$ $|\vec{v}_y| = 5\sqrt{3}$

7. $|\vec{v}| = 3\sqrt{2}$ $\alpha = 315^{\circ}$

8. $\vec{v}_1 \cdot \vec{v}_2 = -10$

9. a) Yes

b) No

c) Yes.

10. $\cos \theta = -\frac{1}{\sqrt{10}}$

11. $1 - \frac{i}{7}$

12. $\sqrt{2} (\cos 135^{\circ} + i \sin 135^{\circ})$

13. $3 - 3\sqrt{3}i$

14. $-5\sqrt{2}$

15. $-5i2 + 5i2\sqrt{3}i$