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Unit M Exam Review

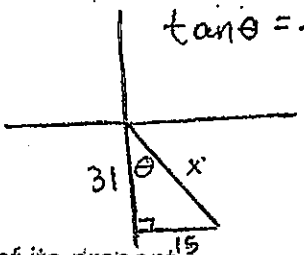
1. A snowmobile in open country must go 31 km south and 15 km east to get home.

   a. What direction ~~should the snowmobile head?~~
   25.8° east of south

   b. How far will the snowmobile have to travel?
   34.4 miles

   $15^2 + 31^2 = x^2$

   $\tan\theta = \frac{15}{31}$

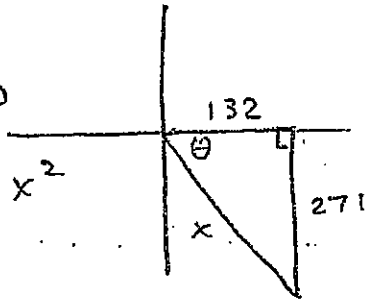


2. A ship is headed toward a port 132 km east and 271 km south of its present location.

   a. What direction ~~should the ship head?~~
   64° south of east

   b. How far will the ship travel?
   301.4 km

   $132^2 + 271^2 = x^2$

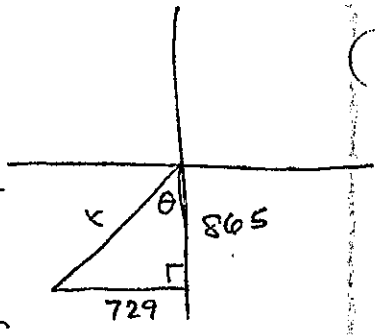


3. An airplane is headed to an airport 865 miles south and 729 miles west of its present location.

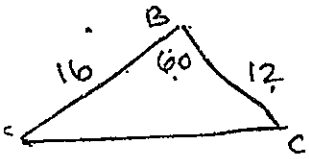
   a. What direction ~~should the plane head?~~
   40° west of south

   b. How far will the plane have to travel?
   1131 Miles

   $729^2 + 865^2 = x^2$



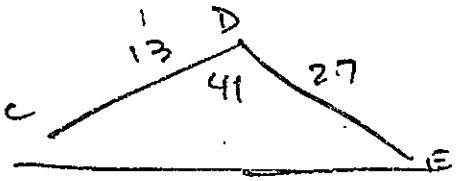
4. In ΔABC, AB=16, BC=12, and m∠B=60. Find the area of ΔABC.



$A = \frac{1}{2} \cdot a \cdot b \cdot \sin C$

Area $= \frac{1}{2} \cdot 16 \cdot 12 \cdot \sin 60 \approx$ 83 units²

5. In ΔCDE, CD=13, DE=27, and m∠D=41. Find the area of ΔCDE.



115 units²

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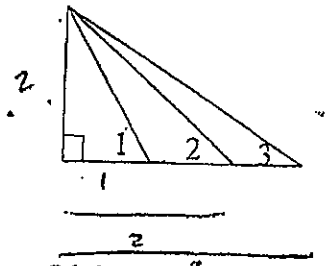
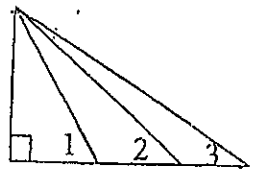
6. Refer to the figure. Of the numbered angles, which has the least tangent?



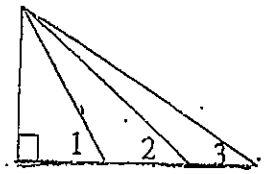
∠3

7. Refer to the figure. Of the numbered angles, which has the least sine?



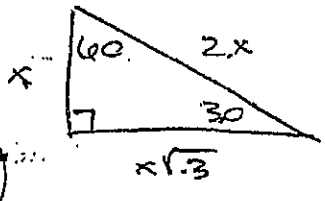
∠3

8. Refer to the figure. Of the numbered angles, which has the greatest cosine?



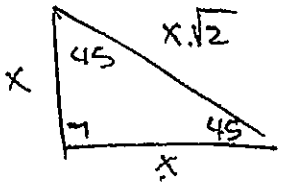
∠3

9. Give the exact value of sin 30. $\frac{x}{2x} = \frac{1}{2}$



10. Give the exact value of cos 45. $\frac{x}{x\sqrt{2}} = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

11. Give the exact value of tan 60. $\frac{x\sqrt{3}}{x} = \sqrt{3}$

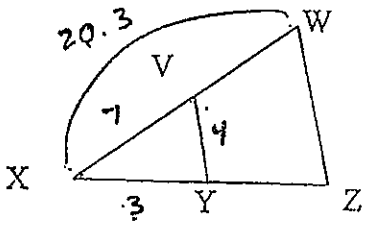


12. Give the exact value of tan 30. $\frac{x}{x\sqrt{3}} = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

13. In ΔXWZ, VY//WZ. If VY=4, WX=20.3, VX=7, and XY=3, find each length to the nearest tenth.

a. WZ $\frac{7}{20.3} = \frac{4}{WZ}$ 11.6

b. XZ



$\frac{7}{20.3} = \frac{3}{XZ}$ 8.7

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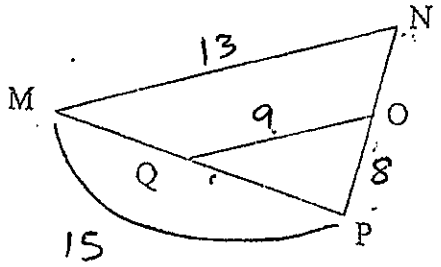
14. In ΔMNP, OQ//NM. If MN=13, PO=8, OQ=9, and MP=15, find each length to the nearest tenth.

a. PQ $\frac{9}{13} = \frac{PQ}{15}$ 10.4

b. ON



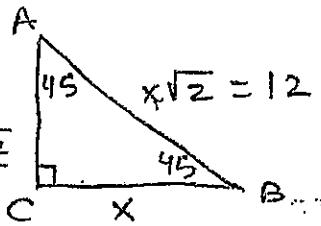
$\frac{9}{13} = \frac{8}{PN}$

PN = 11.6 − 8 ON = 3.6

15. ΔABC is an isosceles right triangle with m∠C=90 and AB=12.

a. Find AC. $6\sqrt{2}$

b. Find BC. $6\sqrt{2}$



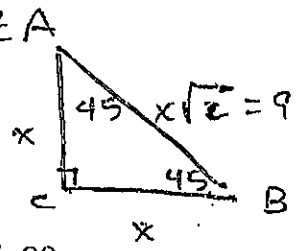
$\frac{x\sqrt{2}}{\sqrt{2}} = \frac{12}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{12\sqrt{2}}{2}$

16. ΔABC is an isosceles right triangle with m∠C=90 and AB=9.

a. Find AC. $\frac{9\sqrt{2}}{2}$

b. Find BC. $\frac{9\sqrt{2}}{2}$

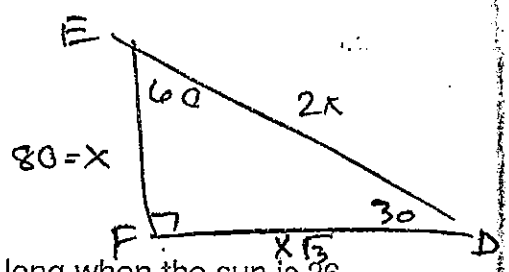
$\frac{x\sqrt{2}}{\sqrt{2}} = \frac{9}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{9\sqrt{2}}{2}$



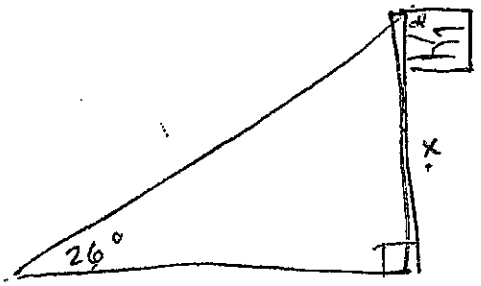
17. ΔDEF is a 30-60-90 triangle with m∠F=90, m∠D=30, and FE=80.

a. Find DE. 160

b. Find DF. $80\sqrt{3}$



18. A flagpole on level ground casts a shadow 18 meters long when the sun is 26 degrees up from the horizon. How tall is the flagpole to the nearest tenth of a meter?



$18 \cdot \tan 26 = \frac{x}{18} \cdot 18$

x = 8.8 m

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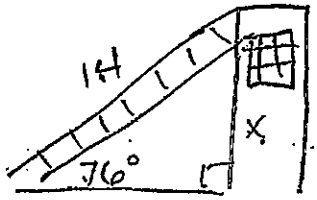
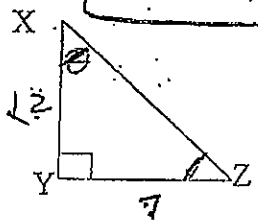
19. How far up a wall can a 14-foot ladder reach if it makes a 76 degree angle with the ground? Round to the nearest tenth of a foot.



$14 \cdot \sin 76 = \frac{x}{14} \cdot 14$

$x = 13.6$ ft

20. In ΔXYZ, XY=12 and YZ=7.



a. Find the measure∠X ~~to the nearest~~ degree. 30°

b. Find the tangent of ∠Z.

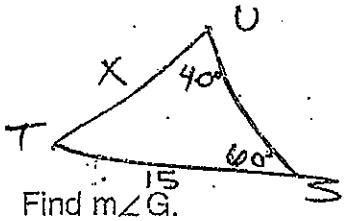
$\tan\theta = \frac{7}{12} = 30°$

$\frac{12}{7}$

21. In ΔTUS, TS=15 m, m∠S=60, and m∠U=40. Find TU.

$\frac{\sin 60°}{x} = \frac{\sin 40°}{15}$

$x = 20.2$

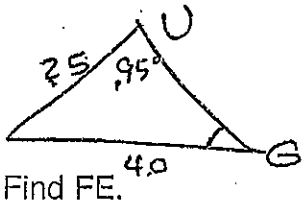


22. In ΔHUG, HU=25 in, m∠U=95, and GH=40 in. Find m∠G.

$\frac{\sin G}{25} = \frac{\sin 95°}{40}$

$\angle G = 38.5°$

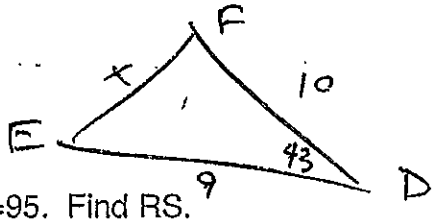
$\sin G = .6226216863$



23. In ΔEFD, ED=9 cm, m∠D=43, and DF=10 cm. Find FE.

$x^2 = 9^2 + 10^2 - 2 \cdot 9 \cdot 10 \cdot \cos 43$

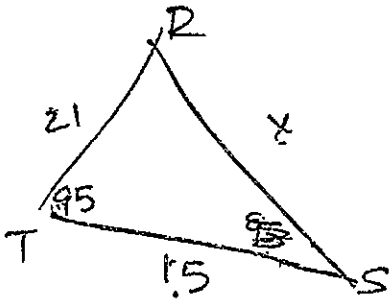
$x = 7.0$



24. In ΔTRS, TR=21 mi, TS=15 mi, and m∠T=95. Find RS.

$\sqrt{x^2} = \sqrt{21^2 + 15^2 - 2 \cdot 21 \cdot 15 \cdot \cos 95}$

$x = 26.8$



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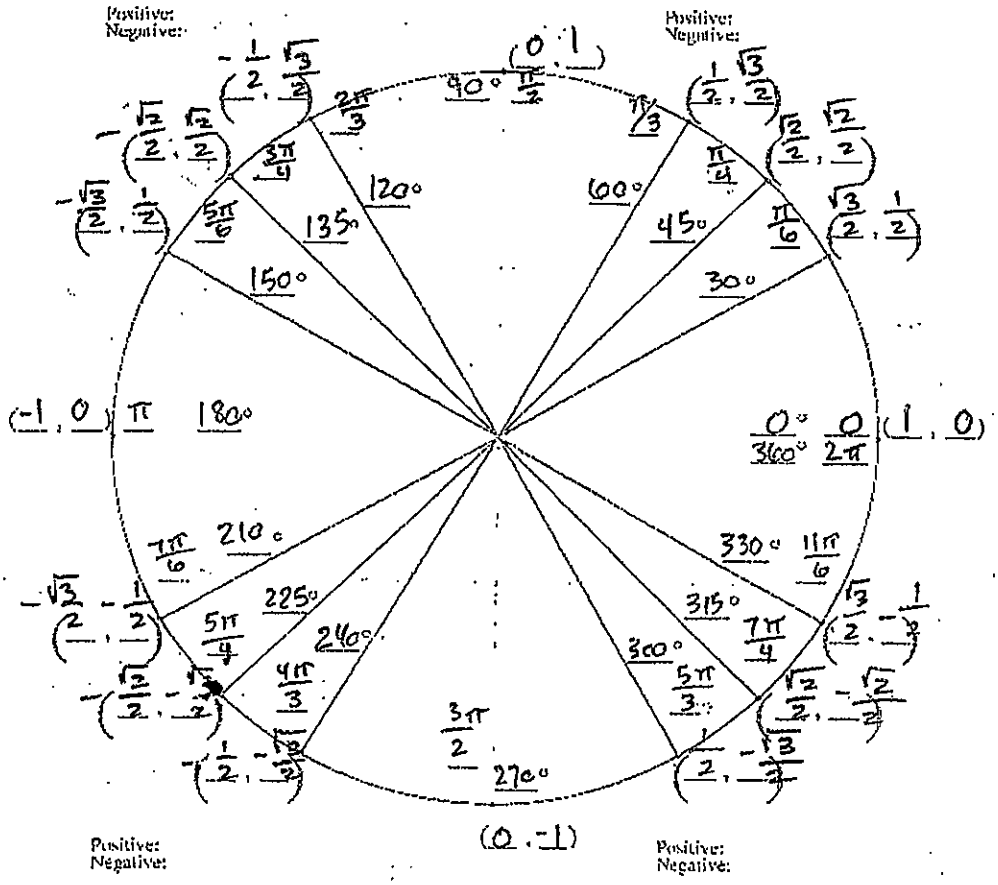
Fill in The Unit Circle



30 - 15 - 15 - 30