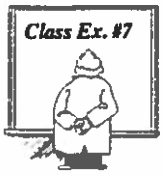
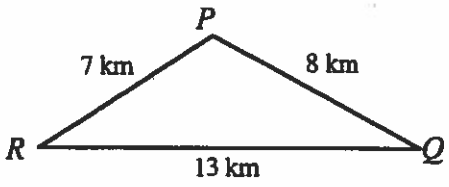
Determine the largest angle in ΔABC if $a = 14.7$, $b = 8.9$, and $c = 12.6$.



Two ships set sail from port, P, heading in different directions. The first ship sails 7 km to R and the second ship sails 8 km to Q. If the distance between R and Q is 13 km, determine the angle between the directions of the two ships.



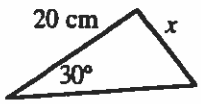
Complete Assignment Questions #5 - #12

Assignment

1. Complete the following for triangle STV.
   a) $s^2 =$ b) $v^2 =$

2. In each case, find the length of the indicated side to the nearest 0.1 cm.

a)



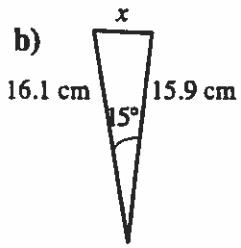
$x^2 = 25^2 + 20^2 - 2(25)(20)\cos 30$

$= 1025 - 1000\cos 30$

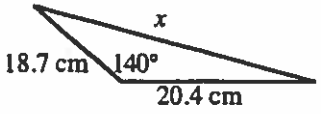
$x^2 = 158.97$

$x = 12.6\text{ cm}$

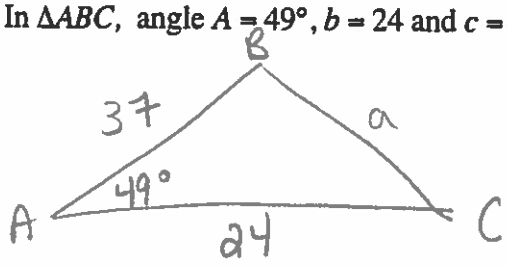
b)



c)



3. In ΔABC, angle $A = 49°$, $b = 24$ and $c = 37$. Calculate a to the nearest whole number.

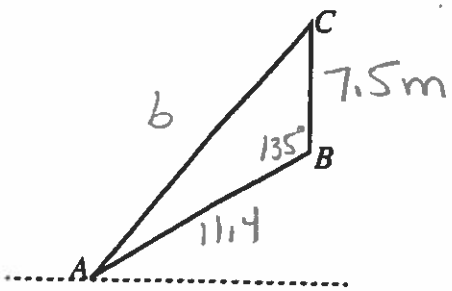


$a^2 = b^2 + c^2 - 2bc\cos A$

$= \sqrt{37^2 + 24^2 - 2(37)(27)\cos 49°}$

$= 28$

4. In the diagram, AB represents part of a road constructed on the incline of a hill. BC represents a telephone pole 7.5 m tall at the side of the road. A guide wire attached to the top of the pole is joined to the ground at A. If $AB = 11.4$ m and $\angle ABC = 135°$, determine the length of the guide wire to the nearest 0.1 m.



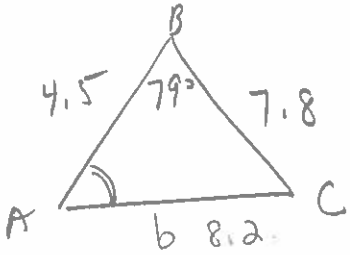
$b^2 = a^2 + c^2 - 2ac\cos B$

$= \sqrt{11.4^2 + 7.5^2 - 2(11.4)(7.5)\cos 135°}$

$= 17.5\text{m}$

5. Solve triangle ABC in which $AB = 4.5$ cm, $BC = 7.8$ cm and angle $ABC = 79°$. Round sides to the nearest tenth of a cm and angles to the nearest tenth of a degree.

all angles, all sides



$b^2 = 4.5^2 + 7.8^2 - 2(4.5)(7.8)\cos 79°$

$b = 8.2\text{cm}$

$\frac{\sin A}{7.8} = \frac{\sin 79}{8.2}$

$\angle A = 68.5°$

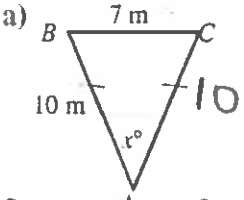
$\angle C = 180 - 79 - 68.5$

$= 32.5°$

6. Complete the following for triangle *DEF*.
   a) $\cos E =$ b) $\cos F =$

7. In each case, find the measure of the indicated angle to the nearest degree.

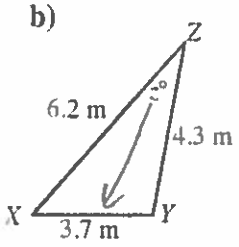
a)



$\cos A = \frac{10^2 + 10^2 - 7^2}{2(10)(10)}$

$\angle X = 41°$

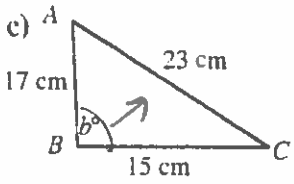
b)



$\cos A = \frac{6.2^2 + 4.3^2 - 3.7^2}{2(6.2)(4.3)}$

$= 36°$

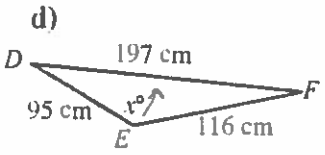
c)



$\cos B = \frac{15^2 + 17^2 - 23^2}{2(17)(15)}$

$B = 92°$

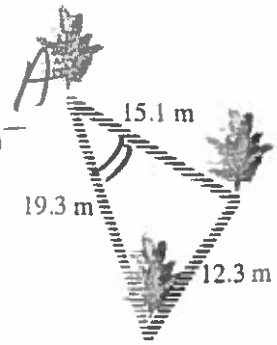
d)



$\cos E = \frac{95^2 + 116^2 - 197^2}{2(95)(116)}$

$E = 138°$

8. Anwar and Ingrid have three trees in their garden. The trees form a triangle as shown in the diagram. Determine the smallest angle between the trees.



$\cos A = \frac{19.3^2 + 15.1^2 - 12.3^2}{2(19.3)(15.1)}$

↓ across shortest side

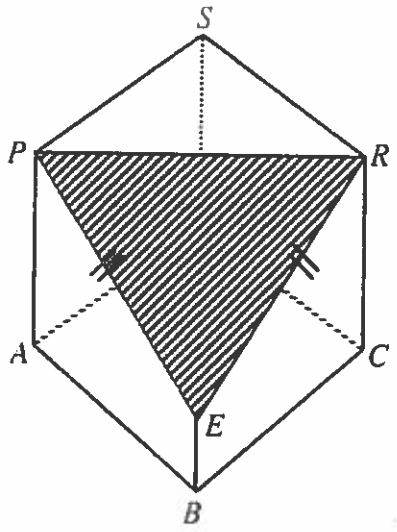
$= \boxed{40°}$

9.

Multiple Choice 10

11.

9. The solid in the diagram was formed by removing a corner from a cube of 24 cm. The length of EB is 6 cm.



a) Calculate, to the nearest tenth, the lengths of PE and PR.

b) Calculate the measure of angle PER to the nearest degree.

Q2

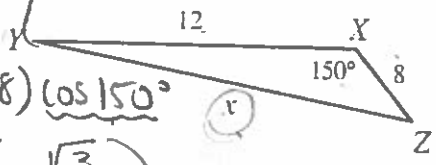
$\cos 150°$

$\theta_R = 30°$ $\cos 30° = \frac{\sqrt{3}}{2}$

$\cos 150° = -\frac{\sqrt{3}}{2}$

10. The value of x^2 is

A. 112
B. 304
C. $208 - 96\sqrt{3}$
D. $208 + 96\sqrt{3}$



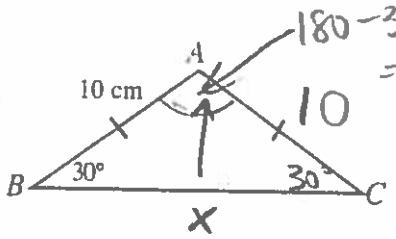
$x^2 = 12^2 + 8^2 - 2(12)(8)\cos 150°$

$x^2 = 208 - 192\left(-\frac{\sqrt{3}}{2}\right)$

$= 208 + 96\sqrt{3}$

11. The length of BC in cm is

A. $5\sqrt{3}$
B. 10
C. $10\sqrt{3}$
D. 20



$180 - 30 - 30 = 120°$

$\frac{x}{\sin 120} = \frac{10}{\sin 30°}$

$x = \frac{10 \sin 120°}{\sin 30°}$

$\sin 30° = \frac{1}{2}$ $\sin 120° =$

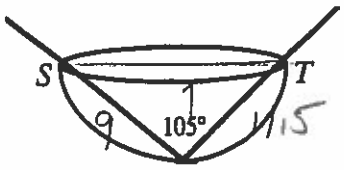
$\theta_R = 60°$

$\sin 60° = \frac{\sqrt{3}}{2}$

$= \frac{10\left(\frac{\sqrt{3}}{2}\right)}{\frac{1}{2}} = \frac{20\sqrt{3}}{2} = 10\sqrt{3}$

Numerical Response

12. The diagram shows a glass bowl with two chop-sticks resting on the rim at points S and T. The lengths of the parts of the chop-sticks inside the bowl are 9 cm and 11.5 cm respectively.



The length of ST, to the nearest tenth of a cm, is _____ .

(Record your answer in the numerical response box from left to right.)

1	6	.	3

$= \sqrt{9^2 + 11.5^2 - 2(9)(11.5)\cos 105}$

$= 16.33479$

Group Investigation

The sines of the angles of a triangle are in the ratio 2:3:4. Determine the ratios of the cosines of the angles.

Answer Key

1. **a)** $s^2 = t^2 + v^2 - 2tv \cos S$ **b)** $v^2 = s^2 + t^2 - 2st \cos V$

2. **a)** 12.6 cm **b)** 4.2 cm **c)** 36.7 cm **3.** 28 **4.** 17.5

5. $\angle ABC = 79°$, $\angle BAC = 68.5°$, $\angle ACB = 32.5°$, $AC = 8.2$ cm, $BC = 7.8$ cm, $AB = 4.5$ cm. Answers may vary slightly depending on method.

6. **a)** $\cos E = \dfrac{d^2 + f^2 - e^2}{2df}$ **b)** $\cos F = \dfrac{d^2 + e^2 - f^2}{2de}$

7. **a)** 41° **b)** 36° **c)** 92° **d)** 138° **8.** 40°

9. **a)** $PE = 30.0$ cm, $PR = 33.9$ cm **b)** 69°

10. D **11.** C **12.**

1	6	.	3

Group Investigation 14:11:–4