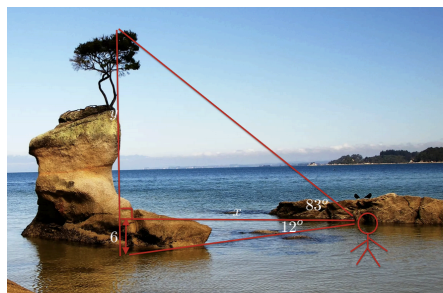




1. Compute the distance x as shown on diagram and measured horizontally from eyesight level as shown. Assume eyesight-level lies 6 ft above ground level.



A

$$x \approx 20$$

B

$$x \approx 209.206$$

C

$$x \approx 356.34$$

D

not enough information given

E

$$x \approx 248.289$$

F

$$x \approx 229.897$$

G

$$x \approx 275.876$$

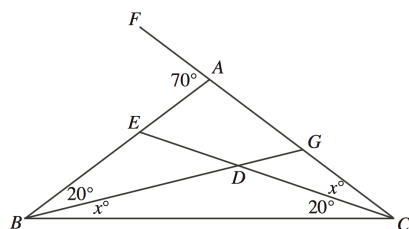
H

$$x \approx 28.228$$

I

none of these

2. Solve for x in the following triangles.



A

$$x = 15$$

B

$$x = 20$$

C

$$x = 35$$

D

$$x = 30$$

E

$$x = 40$$

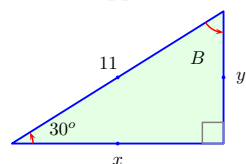
F

$$x = 25$$

G

none of these

3. Select any and all true statement/s in reference to the diagram below. Approximations are acceptable where appropriate.



A

$$x = 11 \cdot \cos 30^\circ$$

B

$$B = \arccos\left(\frac{5.5}{11}\right)$$

C

$$B = 90^\circ - 30^\circ$$

D

$$B = \arcsin\left(\frac{x}{11}\right)$$

E

$$x = \sin 30^\circ$$

F

$$y = 5.5$$

G

$$x = 9.52628$$

H

$$y = 11 \cdot \sin 30^\circ$$

I

$$B = \arcsin\left(\frac{9.52628}{11}\right)$$

4. Select any and all true statement/s in reference to the diagram below. Approximations are acceptable where appropriate.

A

$$y = x \tan(43^\circ)$$

B

$$x \tan(55^\circ) - \tan(43^\circ) = 10 \tan(43^\circ)$$

C

$$y = (x + 10) \tan(55^\circ)$$

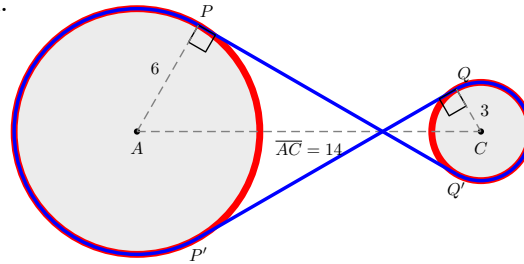
D

$$x \tan(55^\circ) - x \tan(43^\circ) = 10 \tan(43^\circ)$$

E

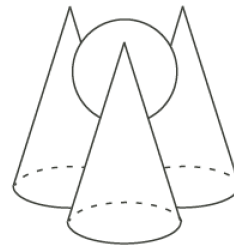
$$x \tan(43^\circ) = (x + 10) \tan(55^\circ)$$

5. Determine the length of the belt on the following pulley system.
Assume all length units are inches.



- ☐ A 67.896 ☐ B 53.5693 ☐ C 62.2899 ☐ D 69.1418
☐ E 56.6838 ☐ F 71.0105 ☐ G none of these

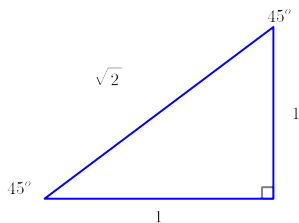
6. Three identical cones each have a radius of 50 and a height of 120. The cones are placed so that their circular bases are touching each other. A sphere is placed so that it rests in the space created by the three cones, as shown. If the top of the sphere is level with the tops of the cones, then the radius of the sphere is closest to



hint: try to imagine the view from the top, then from a side slicing through the middle of the sphere, and one of the cones.

- ☐ A $r \approx 38.7$ ☐ B $r \approx 38.1$ ☐ C $r \approx 38.9$
☐ D $r \approx 38.3$ ☐ E $r \approx 38.5$ ☐ F none of these

7. based on the diagram, select the true statement/s



☐ A

$$\sin(45^\circ) = \frac{1}{\sqrt{2}}$$

☐ B

$$\cos(45^\circ) = \frac{1}{\sqrt{2}}$$

☐ C

$$\sin(45^\circ) = \frac{1}{\sqrt{2}}$$

☐ D

$$\tan(45^\circ) = \frac{1}{1}$$

☐ E

$$\tan(45^\circ) = \frac{1}{1}$$

8. determine

$$\sin(0^\circ)$$

- ☐ A $\frac{0}{2}$ ☐ B $\frac{2}{2}$ ☐ C none of these

9. determine if the reference triangle for

$$-510^\circ$$

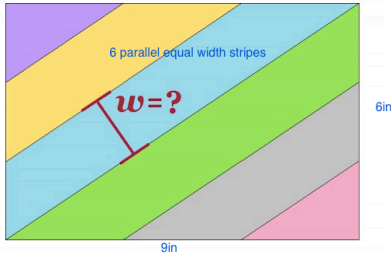
is correctly drawn and labeled.

- ☐ A not correct ☐ B correct

10.

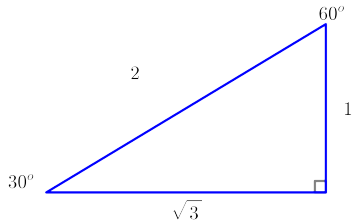
Pre-Calculus Quiz 8 version 1 (page 3/ 7)

Determine the size of w , assume each ribbon has the same width, and the shape is a rectangle.



- ☐ A $w \approx \frac{3}{\sqrt{2}}$
☐ B $w \approx 3/\sqrt{3}$
☐ C $w \approx \frac{3}{2\sqrt{3}}$
- ☐ D $w \approx 3.5$
☐ E none of these

11. based on the diagram, select the true statement/s



☐ A

$$\sin(60^\circ) = \frac{\sqrt{3}}{2}$$

☐ B

$$\sin(30^\circ) = \frac{1}{2}$$

☐ C

$$\cos(30^\circ) = \frac{\sqrt{3}}{2}$$

☐ D

$$\cos(60^\circ) = \frac{\sqrt{3}}{2}$$

☐ E

$$\tan(60^\circ) = \frac{\sqrt{3}}{1}$$

☐ F

$$\cos(60^\circ) = \frac{1}{2}$$

☐ G

$$\tan(60^\circ) = \frac{1}{\sqrt{3}}$$

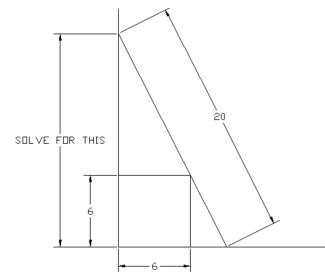
☐ H

$$\tan(30^\circ) = \frac{\sqrt{3}}{1}$$

☐ I

$$\cos(30^\circ) = \frac{1}{2}$$

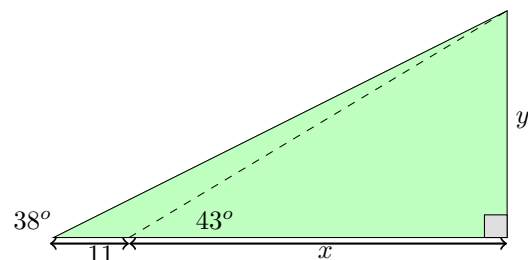
12. A twenty foot ladder leans up against a perpendicular wall and just touches the outer top edge of a 6x6x6 cube packing case pushed up close to the wall. How far up the wall is the top of the ladder?



hint: if needed use a calculator to solve the equation you derive

- ☐ A $h \approx 15.17$
☐ B $h \approx 12.7$
☐ C $h \approx 18.55$
- ☐ D $h \approx 15.21$
☐ E none of these

13. Select any and all true statement/s in reference to the diagram below. Approximations are acceptable where appropriate.



A

$$y = (x + 11) \tan(43^\circ)$$

B

$$x \tan(43^\circ) = (x + 11) \tan(38^\circ)$$

C

$$x [\tan(43^\circ) - \tan(38^\circ)] = 11 \tan(38^\circ)$$

D

$$y = (x + 11) \tan(38^\circ)$$

E

$$y = x \tan(43^\circ)$$

F

$$x \tan(43^\circ) = x \tan(38^\circ) + 11 \tan(38^\circ)$$

G

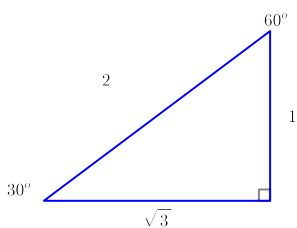
$$x \tan(43^\circ) - x \tan(38^\circ) = 11 \tan(38^\circ)$$

H

$$x = \frac{11 \tan(38^\circ)}{\tan(43^\circ) - \tan(38^\circ)}$$

I none of these

14. based on the diagram, select the true statement/s



A

$$\sin(30^\circ) = \frac{1}{2}$$

B

$$\cos(60^\circ) = \frac{\sqrt{3}}{2}$$

C

$$\sin(60^\circ) = \frac{1}{2}$$

D

$$\cos(30^\circ) = \frac{1}{2}$$

E

$$\cos(30^\circ) = \frac{\sqrt{3}}{2}$$

F

$$\sin(30^\circ) = \frac{\sqrt{3}}{2}$$

G

$$\tan(30^\circ) = \frac{1}{\sqrt{3}}$$

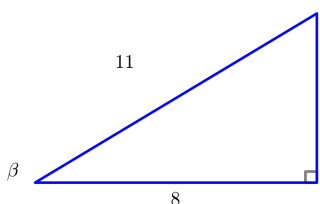
H

$$\tan(60^\circ) = \frac{\sqrt{3}}{1}$$

15. Suppose β is positive and less than 90° , and assume we know

$$\cos(\beta) = \frac{8}{11}$$

Select the true statement/s



A

$$\sin(\beta) = \frac{\sqrt{11^2 - 8^2}}{11}$$

B

$$\tan(\beta) = \frac{8}{\sqrt{11^2 - 8^2}}$$

C

$$\sin(\beta) = \frac{8}{11}$$

D

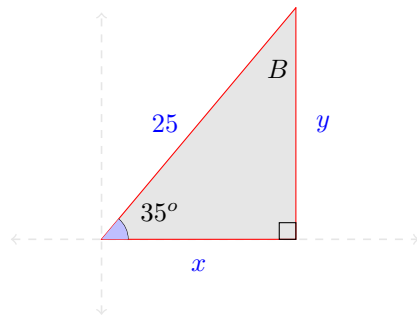
$$\tan(\beta) = \frac{\sqrt{11^2 - 8^2}}{8}$$

E

$$\cos(\beta) = \frac{\sqrt{11^2 - 8^2}}{11}$$

16.

Select any and all true statement/s in reference to the diagram below. Approximations are acceptable where appropriate.

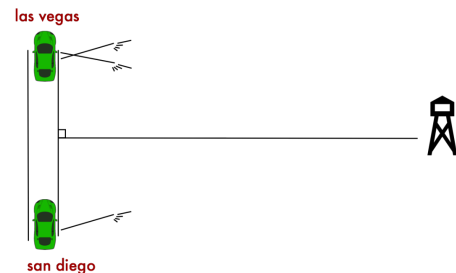


- ☐ A $B = \arccos\left(\frac{25}{x}\right)$
- ☐ B $B = \arcsin\left(\frac{14.33941}{25}\right)$
- ☐ C $B = \arccos\left(\frac{14.33941}{25}\right)$
- ☐ D $x = 14.33941$
- ☐ E $B = \arccos\left(\frac{20.4788}{25}\right)$
- ☐ F $x = 25 \cdot \cos 35^\circ$
- ☐ G $y = 14.33941$
- ☐ H $y = 25 \cdot \sin 35^\circ$

17. Suppose on your drive to Vegas you see an object in the far distance. You stick your handout and point at it, and keep your arm fixed and frozen. Suppose 4 miles later you pass the object at a perpendicular distance to the road, then another 4 miles later you stick out your other arm and point at the object (with your unfrozen arm). Suppose now you observe the angle you have created with your arms to be 14° . How far is the object from the road? [hint: draw your arms as if they were very very long]

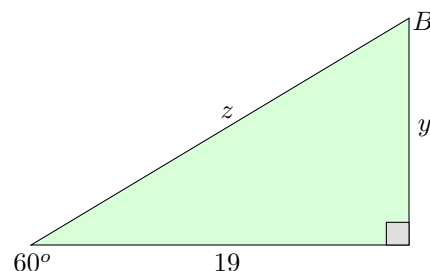
- ☐ A not enough information given
- ☐ B $x = 34.20626 \text{ miles}$
- ☐ C $x = 29.9712 \text{ miles}$
- ☐ D $x = 26.06191 \text{ miles}$
- ☐ E $x = 38.76709 \text{ miles}$
- ☐ F none of these

18. Suppose on your drive to Vegas you see an object in the far distance. You stick your handout and point at it, and keep your arm fixed and frozen. Suppose 4 miles later you pass the object at a perpendicular distance to the road, then another 4 miles later you stick out your other arm and point at the object (with your unfrozen arm). Suppose now you observe the angle you have created with your arms to be 22° . How far is the object from the road? [hint: draw your arms as if they were very very long]



- ☐ A $x = 21.40135 \text{ miles}$
- ☐ B $x = 20.57822 \text{ miles}$
- ☐ C not enough information given

19. Solve the triangle completely. Then use your solution to select any and all true statement/s in reference to the diagram below. Approximations are acceptable where appropriate.



☐ A $z = 38$

☐ B $y = 19 \cdot \tan 60^\circ$

☐ C $y = \tan 60^\circ$

☐ D $B = \arccos\left(\frac{y}{z}\right)$

☐ E $z = 19 \div \cos 60^\circ$

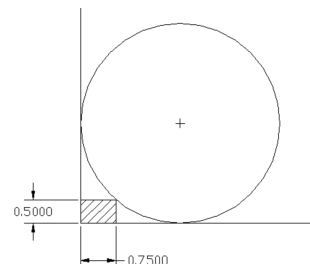
☐ F $y = 32.90897$

☐ G $B = 30^\circ$

☐ H $y = z \cdot \sin 60^\circ$

☐ I $B = \arcsin\left(\frac{19}{z}\right)$

20. The circle above is tangent to both the horizontal and vertical lines. It also touches the corner of the .5 by .75 rectangle. Solve for the radius of the circle.



☐ A $r \approx 5.27$

☐ B $r \approx 8.25$

☐ C $r \approx 15.71$

☐ D $r \approx 2.57$

☐ E none of these

21. Suppose on a nice december evening you gaze upon your favorite star. You stick your handout into the sky and point at it, then you keep your arm fixed and frozen. Until 6 months later when you reach for the sky again and point at your star with your other arm. Suppose now you observe the angle you have created with your arms to be 0.29° . How far is the star from the sun? [hint: assume the earth orbits in a circular motion around the sun once every 12 month, where the orbit has radius of $r = 149.6 \times 10^6 km$]

☐ A

$x = 58522179400.965 km$

☐ B

$x = 49655182522.031 km$

☐ C

$x = 63842377528.325 km$

☐ D

$x = 59113312526.227 km$

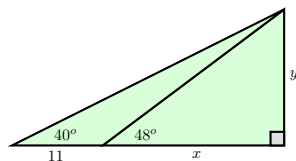
☐ E not enough information given

☐ F

$x = 66206910029.374 km$

☐ G none of these

22. Select any and all true statement/s in reference to the diagram below. Approximations are acceptable where appropriate.



☐ A

$y = x \tan(40^\circ)$

☐ B

$x \tan(48^\circ) - \tan(40^\circ) = 11 \tan(40^\circ)$

☐ C

$x \tan(48^\circ) = x + 11 \tan(40^\circ)$

☐ D

$x = 33.99506$

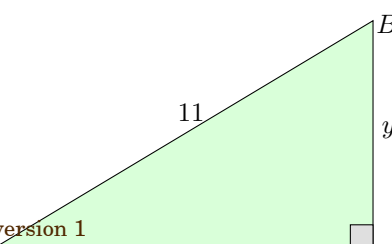
☐ E

$y = 37.75534$

☐ F

$y = (x + 11) \tan(48^\circ)$

23. Select any and all true statement/s in reference to the diagram below. Approximations are acceptable where appropriate.



☐ A $B = \arccos\left(\frac{5.5}{11}\right)$

☐ B $y = 11 \cdot \cos 30^\circ$

☐ C $y = 5.5$

☐ D $B = 90^\circ - 30^\circ$

☐ E $x = 11 \cdot \sin 30^\circ$

☐ F $B = \arccos\left(\frac{y}{11}\right)$

☐ G $B = \arcsin\left(\frac{x}{11}\right)$

☐ H $y = 11 \cdot \sin 30^\circ$

☐ I $x = 11 \cdot \cos 30^\circ$

24. Select the true statement/s

☐ A $\cos^2(45^\circ) = \cos(60^\circ)$

☐ B $\sin(2 \cdot 45^\circ) = 2 \sin(30^\circ)$

☐ C $\sin(60^\circ) = \cos(30^\circ)$

☐ D $\sin^2(30^\circ) = \sin(45^\circ)$

☐ E $\sin(30^\circ) = \cos(60^\circ)$

☐ F $\cos(2 \cdot 60^\circ) = 2 \cos(45^\circ)$

☐ G $\sin^2(45^\circ) = \sin(30^\circ)$

☐ H $\cos^2(60^\circ) = \cos(60^\circ)$

☐ I $\sin^2(45^\circ) = \sin(45^\circ)$

25. Determine the length of the belt on the following pulley system.
Assume all length units are inches.

☐ A 89.6355

☐ B 75.9623

☐ C 63.8083

☐ D 67.6064

☐ E 85.0778

☐ F 85.8374

☐ G none

of these

