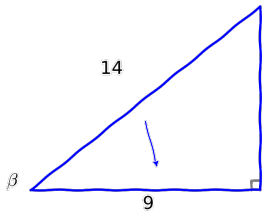
141.q07 PreCalc Quiz 7 version 1

name:

1. Which expression describes the measurement of the angle below:



A $\beta = \cos^{-1}\left(\frac{9}{14}\right) \approx 0.87257$

B $\beta = \sin^{-1}\left(\frac{14}{9}\right) \approx 0.69822$

C $\beta = \tan^{-1}\left(\frac{14}{9}\right) \approx 0.57134$

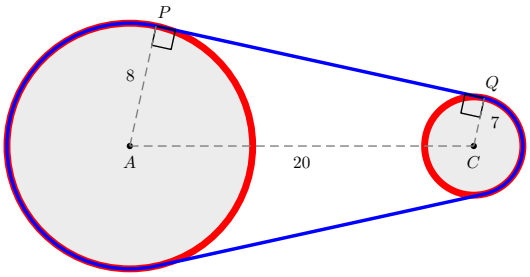
2. Select expressions equivalent to:

$$\sin(x+y)$$

A $\sin(x) + \sin(y)$

B none of these

3. Consider the following belt-pulley system. Assume the indicated radius segment is perpendicular to the direction of the portion of the belt that does not touch the pulley. Find the length of the part of the belt that touches the left pulley as indicated below.



A left arc ≈ 29.703

B left arc ≈ 28.446

C left arc ≈ 20.907

D left arc ≈ 23.42

E left arc ≈ 22.163

F left arc ≈ 25.933

G none of these

4.

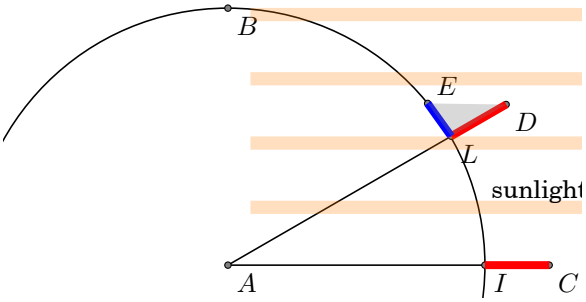
$$\frac{opp}{hyp}$$

A $\sin(\theta)$

B $\tan(\theta)$

C $\cos(\theta)$

5. Suppose two 5-meter poles are fixed to the ground in upright position [in red], one in San Diego, CA and the other 359 miles due east near Phoenix, AZ. Assume both lie on the earths equator. Suppose at noon the pole in San Diego casts NO shadow, while the pole in Phoenix casts a shadow of 0.51 meters [in blue]. Based on this information and the diagram shown, select the true statement/s, assume r is unknown, and refers to the radius of the earth, assume approximations are acceptable where appropriate. Assume θ refers to angle $\angle LDE$ and assume the world is perfectly round.



A the radius of the earth, $r \approx 3531.78$ miles

B $\theta = 5.82403^o$

C The portion of the circumference of the earth from one pole to the other is 359 miles

D $\theta = \cos^{-1}\left(\frac{0.51}{5}\right)$

E $r = \frac{359}{\frac{5.82403^o}{360^o} \cdot 2\pi} miles$

F $359 miles = \frac{5.82403^o}{360^o} \cdot 2\pi r$

G the radius of the earth, $r \approx 3351.66$ miles

H The portion of the circumference of the earth from one pole to the other is $\frac{5.82403^o}{360^o} \cdot 2\pi r$

I $\theta = \tan^{-1}\left(\frac{0.51}{5}\right)$

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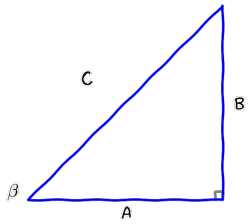
6. Which expression describes the measurement of the angle below:



A $\beta = \sin^{-1}\left(\frac{B}{C}\right)$

B $\beta = \sin^{-1}\left(\frac{A}{C}\right)$

C $\beta = \cos^{-1}\left(\frac{A}{C}\right)$

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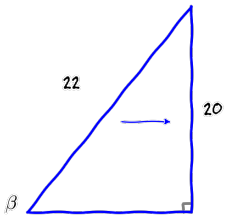
7. Which expression describes the measurement of the angle below:



A $\beta = \arcsin\left(\frac{20}{22}\right) \approx 65.38002^o$

B $\beta = \arccos\left(\frac{22}{20}\right) \approx 24.61998^o$

C $\beta = \arctan\left(\frac{20}{22}\right)$

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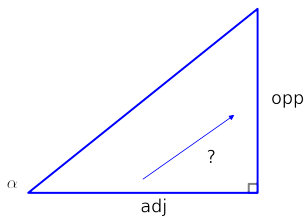
8. identify the indicated ratio



A $\tan(\alpha)$

B $\cos(\alpha)$

C $\sin(\alpha)$

9. Compute the distance y as shown on diagram and measured from eyesight level to the top of the tree. Assume eyesight-level lies 6 ft above ground level.

A $y \approx 17$

B not enough information given

C $y \approx 17.25$

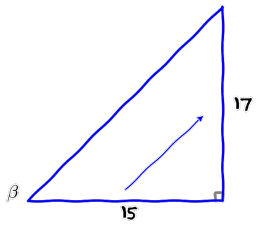
D $y \approx 20.25$

E $y \approx 19$

F $y \approx 39.5$

G none of these

10. Which expression describes the measurement of the angle below:

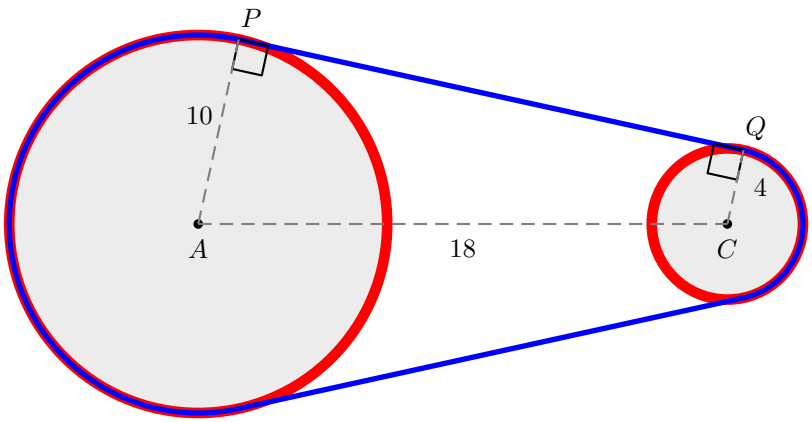


A $\beta = \cos^{-1}\left(\frac{15}{17}\right) \approx 1.08084$

B $\beta = \tan^{-1}\left(\frac{17}{15}\right) \approx 0.84782$

C $\beta = \cos^{-1}\left(\frac{17}{15}\right) \approx 1.08084$

11. Consider the following belt-pulley system. Assume the indicated radius segment is perpendicular to the direction of the portion of the belt that does not touch the pulley. Find the angle α, defined by $\angle PAC$.



A $\alpha = \sin^{-1}\left(\frac{4}{10}\right)$

B $\alpha = \cos^{-1}\left(\frac{10}{18}\right)$

C $\alpha \approx 70.53^o$

D $\alpha \approx 56.25^o$

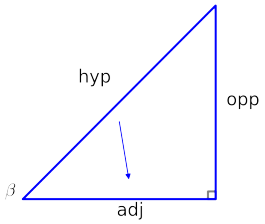
E $\alpha = \cos^{-1}\left(\frac{4}{18}\right)$

F $\alpha = \sin^{-1}\left(\frac{10}{4}\right)$

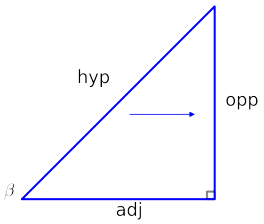
G $\alpha \approx 77.16^o$

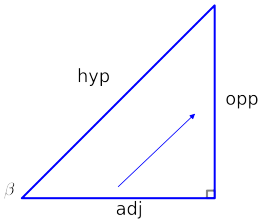
H $\alpha \approx 1.23^o$

12. Which ratio is described by:

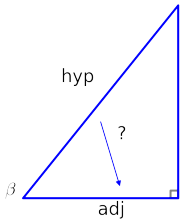


A $\cos(\beta)$

B 

C 

13. identify the indicated ratio



A $\tan(\beta)$

B $\cos(\beta)$

C $\sin(\beta)$

14. Select the true statement/s

A $\cos^2(30^o) = \cos(60^o)$

B $\sin(60^o) = \cos(30^o)$

C $\sin^2(30^o) = \sin(60^o)$

D $\sin^2(45^o) = \sin(30^o)$

E $\sin(2 \cdot 45^o) = 2\sin(30^o)$

F $\sin(45^o) = \cos(45^o)$

G $\sin(30^o) = \cos(60^o)$

H $\sin(60^o) = \cos(45^o)$

I $\sin^2(60^o) = \sin(60^o)$

15.

A $\dfrac{adj}{hyp}$

B $\cos(\theta)$

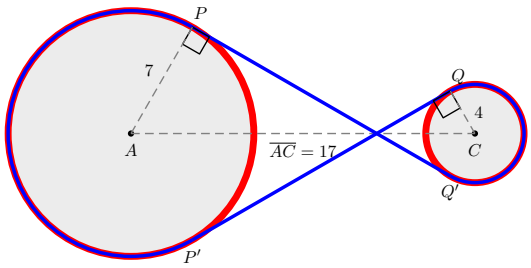
C $\sin(\theta)$

$\tan(\theta)$

16. A toy store sells 1 toy at 1 dollar, the toy comes in a box. You can exchange 3 empty boxes for 1 toy. If you have 15 dollars, what is the maximum number of toys you can get?

A 17 B 22 C 21 D 19 E 16
F 15 G 20 H 18

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



A 85.8374 B 65.3276 C 75.9623
D 69.1257 E 90.3951 F none of these

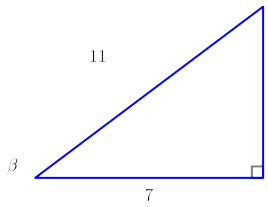
18. Compute the distance x as shown on diagram and measured horizontally from eyesight level as shown. Assume eyesight-level lies 6 ft above ground level.

A not enough information given B $x \approx 24$ C $x \approx 210.643$ D $x \approx 228.96$ E $x \approx 24.065$ F $x \approx 370.915$ G $x \approx 258.725$ H $x \approx 254.146$ I none of these

19. Suppose β is positive and less than 90^o, and assume we know

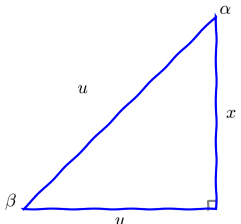
$$\cos(\beta) = \frac{7}{11}$$

Select the true statement/s



A $\tan(\beta) = \frac{\sqrt{11^2 - 7^2}}{7}$ B $\tan(\beta) = \frac{7}{\sqrt{11^2 - 7^2}}$ C $\sin(\beta) = \frac{\sqrt{11^2 - 7^2}}{11}$ D $\sin(\beta) = \frac{7}{11}$ E $\cos(\beta) = \frac{\sqrt{11^2 - 7^2}}{11}$

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



A

$$\tan(\alpha) = \frac{y}{x}$$

B

$$\cos(\alpha) = \frac{y}{u}$$

C

$$\tan(\alpha) = \frac{x}{y}$$

D

$$\cos(\beta) = \frac{x}{u}$$

E

$$\sin(\beta) = \frac{x}{u}$$

F

$$\sin(\alpha) = \frac{y}{u}$$

G

$$\tan(\beta) = \frac{x}{y}$$

H

$$\sin(\beta) = \frac{y}{u}$$

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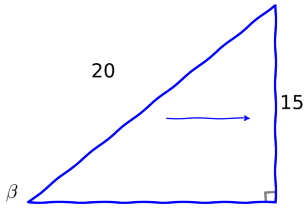
21. Which expression describes the measurement of the angle below:



A

$$\beta = \arcsin\left(\frac{15}{20}\right) \approx 48.59038^o$$

B

$$\beta = \arccos\left(\frac{15}{20}\right) \approx 41.40962^o$$

C

$$\beta = \arcsin\left(\frac{20}{15}\right)$$

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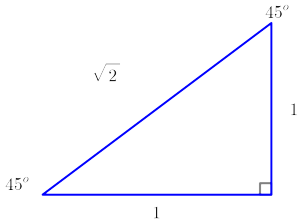
22. based on the diagram, select the true statement/s



A

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

B

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

C

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

D

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

E

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

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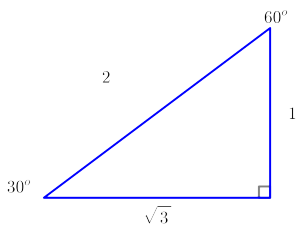
23. based on the diagram, select the true statement/s



A

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

B

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

C

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

D

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

E

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

F

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

G

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

H

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

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24. Select expressions equivalent to:

$$\sin(7x)$$

A

$$7\sin(x)$$

B none of these

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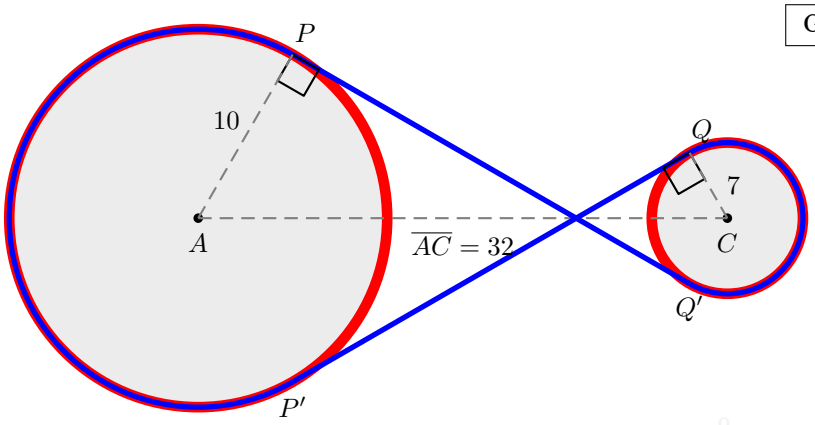
25. Determine the length of the belt on the following pulley system. Assume all length units are inches.



A 145.6721 B 108.9374 C 152.0057
D 126.6714 E 112.7375 F 149.4723
G none of these
