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.

   C $x \approx 119.521$

A $x \approx 35.5$

B $x \approx 28.228$

D   not enough information given

E $x \approx 140.769$

F $x \approx 144.753$

G $x \approx 132.801$

H $x \approx 151.393$

I   none of these

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2. prove: identity or not $\sec(-2x)\sec(x) = \frac{1}{2\cos(x)^3 - \cos(x)}$
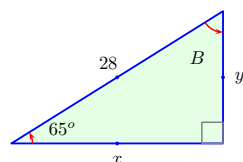
A   not identity

B   identity

---

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

A $x = 25.37662$

B $y = 11.83331$

C $x = 28 \cdot \sin 65^o$

D $B = \arcsin\left(\frac{x}{28}\right)$

E $B = \arccos\left(\frac{11.83331}{28}\right)$

F $y = 25.37662$

G $B = \arccos\left(\frac{y}{28}\right)$

4.

$$\frac{\cos(x) + 1}{\sin(x)} = \cot(x) + \csc(x)$$

A   identity

B   not identity

---

5. prove or disprove $\sin a - \sin b = 2\sin\left(\frac{a-b}{2}\right)\cos\left(\frac{a+b}{2}\right)$

A   Identity

B   NOT identity

---

6. Suppose   then..

$$-2 + 2i = re^{i\theta}$$

A	

$$\cot(\theta) = \frac{2}{-2}$$

B	

$$r^2 = (-2) + (2)$$

C	

$$r^2 = (-2)^2 + (2)^2$$

D	

$$\tan(\theta) = \frac{-2}{2}$$

E	

$$r^2 = (-2) + (2)^2$$

F	

$$\tan(\theta) = \frac{2}{-2}$$

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7. Determine the equation/s represented by this graph.
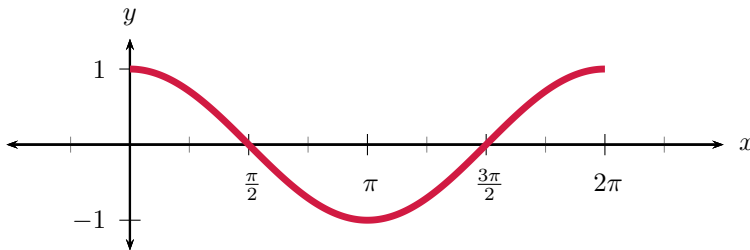
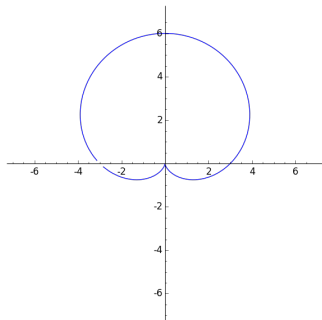| A	$y = -\cos(x - 2\pi)$
B	$y = \sin\left(x - \frac{3\pi}{2}\right)$
C	$y = \cos(x + 2\pi)$
D	$y = -\cos(x)$
E	$y = \sin\left(x - \frac{\pi}{2}\right)$
F	$y = \cos(-3\pi)$
G	$y = \cos(x + 4\pi)$

---

8. Match the graph with the equation

A	$r = 3\sin(\theta) - 3$
B	$r = 3\cos(\theta) - 3$
C	$r = -3\sin(-3\theta)$
D	$r = -3\cos(-3\theta)$
E	none of these

---

9. (Assume none of the quantities are zero) Suppose we know

$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

Select variations of the same statement as above [i.e. equivalent statements.]

A	

$$\frac{b}{\sin B} = \frac{a}{\sin A}$$

B	b is to $\sin B$ AS a is to $\sin A$.

C	

$$b\sin A = a\sin B$$

D	

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

E	

$$\sin A = \frac{a\sin B}{b}$$

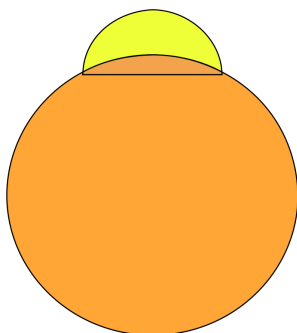| F	$\sin A$ is to a as $\sin B$ is to b.

G	

$$\frac{a\sin B}{\sin A} = b$$

H	none of these

10. Assume we have a circle of radius 5 and a semicircle of radius 2 overlapping where the corners of the semicircle are on the larger circle, as follows. Compute the shown yellow area.

B	$\frac{2}{6} \cdot \pi 2^2 - \frac{\sqrt{2}}{6}\pi 5^2$
C	$\pi 5^2 - \frac{\sqrt{2}}{3} \cdot \pi 2^2$
D	$\pi 5^2 - \frac{2}{\sqrt{3}} \cdot \pi 2^2$
E	not enough information
F	$\frac{1}{3} \cdot \pi 2^2 - \frac{1}{6}\pi 5^2$
G	$\pi 5^2 - \frac{\sqrt{2}}{\sqrt{3}} \cdot \pi 2^2$
H	$\pi 5^2 - \frac{1}{3} \cdot \pi 2^2$
I	none of these

A	$\frac{2}{\sqrt{5}} \cdot \pi 2^2 - \frac{\sqrt{2}}{6}\pi 5^2$

11.

$$-\frac{\cos(x)}{\sin(x)+1} - \frac{\cos(x)}{\sin(x)-1} = -\frac{2\cos(x)\sin(x)}{\sin(x)^2-1}$$

A	identity
B	not identity

12.

$$-\frac{\cot(x)\sin(x)}{\cos(x)^2-1} = -\frac{\cos(x)}{\cos(x)^2-1}$$

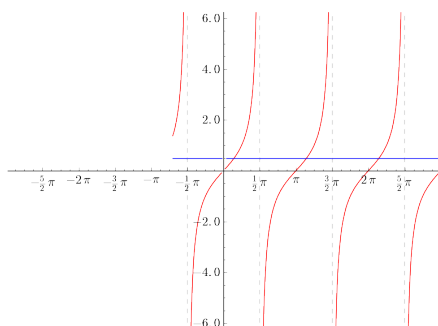| A	identity
B	not identity

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13. Practice Work on each side: Assume there is an interesting world in which $y^2 = y$ for all values of y (including for all integer numbers). In such world, Determine if the following is an identity (prove your answer): $25 + 5 = 0$

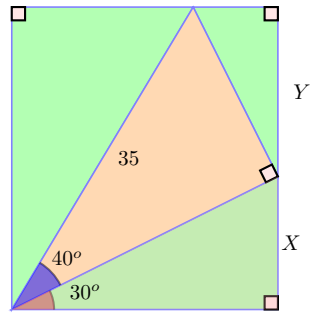| A	Identity
B	NOT identity

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14. Solve showing all work

$$\tan(x) = -\frac{1}{10}$$

A	$-5.74^o + k \cdot 180^o$ for $k \in \mathbf{Z}$
B	$21.29^o + k \cdot 180^o$ for $k \in \mathbf{Z}$
C	$-5.71^o + k \cdot 180^o$ for $k \in \mathbf{Z}$
D	$...,-165.43^o, -105.43^o, -45.43^o, 14.57^o, 74.57^o, 134.57^o, 194.57^o,...$
E	none of these

15.

Determine the value of X and Y.

A	$X = 2 \cdot 35 \cdot \cos(30^o)\sin(40^o)$
B	$Y = 35 \cdot \cos(30^o)\cos(40^o)$
C	$X = 35 \cdot \sin(30^o)\sin(40^o)$
D	$X = 35 \cdot \cos(30^o)\sin(40^o)$
E	$Y = 35 \cdot \sin(30^o)\cos(40^o)$
F	$Y = 35 \cdot \sin(30^o + 40^o)$
G	none of these

1) B, 2) B, 3) DFG, 4) A, 5) A, 6) CF, 7) BCG, 8) A, 9) ABCDEFG, 10) I, 11) A, 12) A, 13) A, 14) C, 15) DE