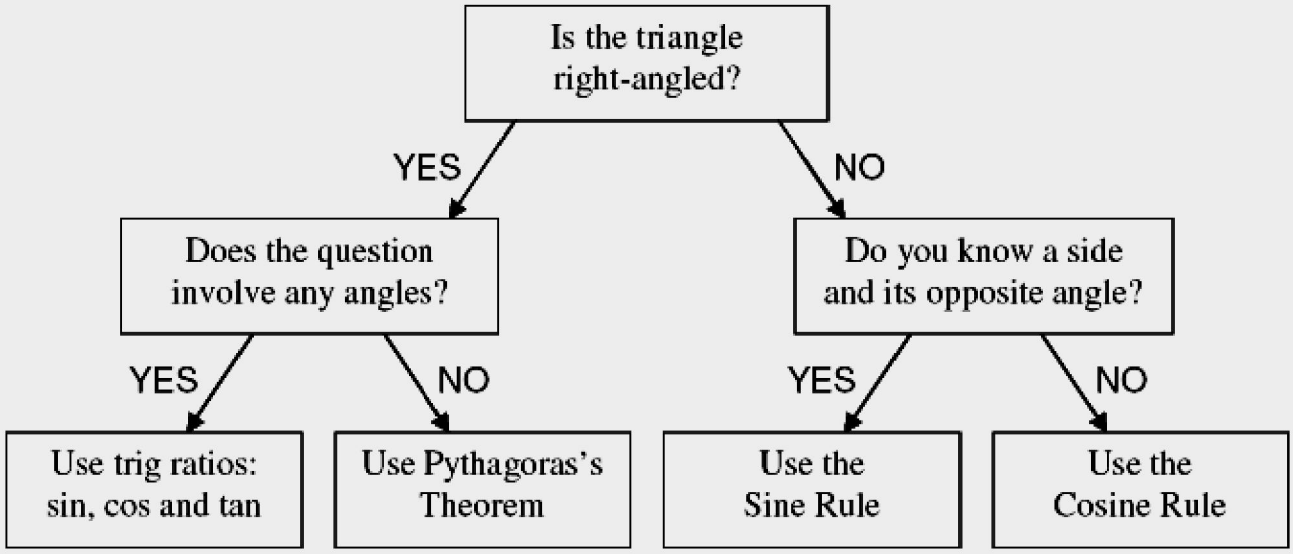
Trigonometric functions

Name: _____

class: ____ **class no:** ____

Choosing The Appropriate Technique



Sigle angle Identities

Reciprocal Identities:

$$\sec\theta = \frac{1}{\cos\theta} \qquad \csc\theta = \frac{1}{\sin\theta} \qquad \cot\theta = \frac{1}{\tan\theta}$$

Quoteint Identities:

$$\tan\theta = \frac{\sin\theta}{\cos\theta} \qquad \cot\theta = \frac{\cos\theta}{\sin\theta}$$

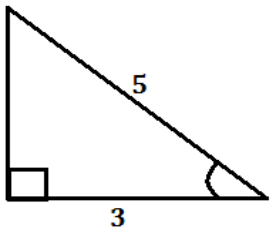
Pythagorean Identity:

$$\sin^2\theta + \cos^2\theta = 1 \qquad \tan^2\theta + 1 = \sec^2\theta \qquad 1 + \cot^2\theta = \csc^2\theta$$
$$1 - \sin^2\theta = \cos^2\theta \qquad \sec^2\theta - \tan^2\theta = 1 \qquad \csc^2\theta - \cot^2\theta = 1$$
$$1 - \cos^2\theta = \sin^2\theta \qquad \sec^2\theta - 1 = \tan^2\theta \qquad \csc^2\theta - 1 = \cot^2\theta$$

Trigonometric functions

PART ONE: Multiple Choices (Circle only the correct Answer)

1. Given the diagram below, which equation is correct?



a) $sin\theta = \frac{5}{3}$

b) $cos\theta = \frac{5}{3}$

c) $sin\theta = \frac{3}{5}$

d) $cos\theta = \frac{3}{5}$

2. Using $\mathbf{sin\ 30^0 = \frac{1}{2}}$, find $\mathbf{tan 30^0}$? 2017 p2

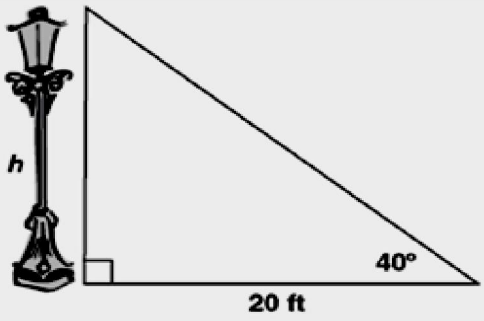
a) $\frac{1}{2}$

b) $\frac{\sqrt{3}}{2}$

c) $\sqrt{3}$

d) $\frac{\sqrt{3}}{3}$

3. Approximately how many feet tall is the Hargeisa streetlight shown?



$\sin 40^\circ \approx 0.64$
$\cos 40^\circ \approx 0.77$
$\tan 40^\circ \approx 0.84$

a) 12.8

b) 15.4 C.

c) 16.8

d) 23.8

4. The expression $Cot\theta\ x\ Sec\theta$ is equivalent to: 2015 p2

a) Cosecθ

b) $\frac{Cos\theta}{Sin\theta}$

c) $\frac{Sin\theta}{Cos^2\theta}$

d) $\frac{1}{Sin\theta}$

5. Given $Cosx = \frac{5}{13}$, find $Tan\ x$ without using table or calculator: 2015 p2

a) $\frac{12}{5}$

b) $\frac{13}{5}$

c) $\frac{5}{12}$

d) $\frac{12}{13}$

Trigonometric functions

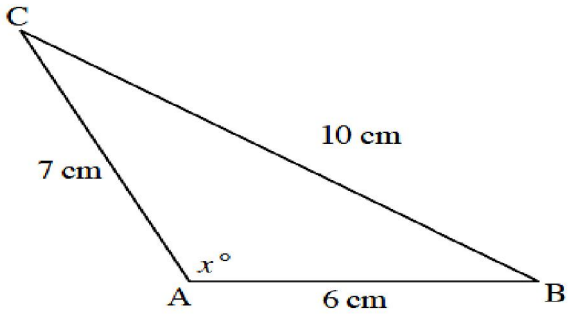
6. Determine the size of the **Angle marked with x^0**?

a) 100.3^0

b) -79.3^0

c) 160^0

d) 120^0



7. The angles of a quadrilateral are: $x^0, 2x^0, 2x^0, x^0$ what is the value of x? 2016 p1

a) 360^0

b) 30^0

c) 90^0

d) 60^0

8. Sin $\frac{7\pi}{2}$ is equal to: 2016 p2

a) 0

b) -1

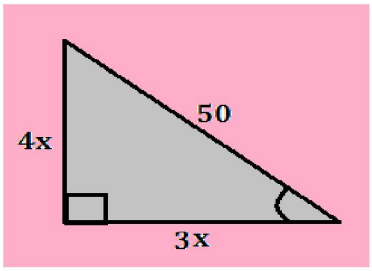
c) 1

d) $\frac{1}{2}$

9. What is the value of x in the given triangle?

a. 20 **b.** 10

c. 30 **d.** 6.7



10. The value of $sin150^0$: 2017 p1

a) $\frac{1}{\sqrt{2}}$

b) $\frac{\sqrt{3}}{2}$

c) 3

d) $\frac{1}{2}$

11. The identity $sin^2x + cos^2x$ is equal to: 2017 p1

a) -1

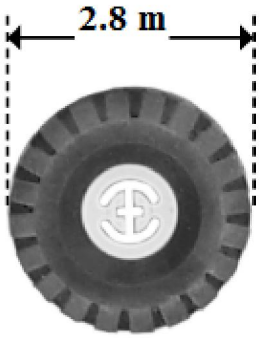
b) $\sqrt{3}$

c) 1

d) 0

Trigonometric functions

10. Determine **how many complete revolutions** will the wheel below made when it travels a distance of 1200 meters.



a. 136 times

b. 134 times

c. 88 times

d. 8.8 times

11. For the Cosine Rule of any triangle ABC, the b^2 is equal to

a) $a^2 - c^2 + 2ab \cos A$

b) $a^3 + c^3 - 3ab \cos A$

c) $a^2 + c^2 - 2ac \cos B$

d) $a^2 + c^2 - 4bc \cos A$

12. An Ant is walking along the ground and stops to look up at a tree. The Angle of elevation from the Ant's viewpoint to the top of the top of the tree is 40^0 and the distance that the Ant is from the foot of the tree is 75m.

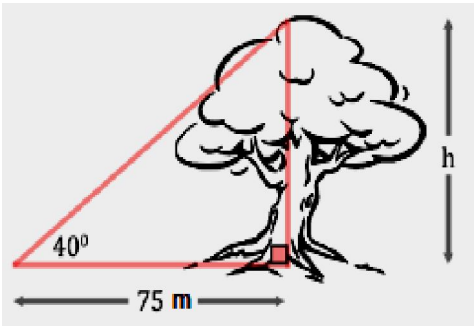
Find the **height** of the tree to the nearest whole number.

a) 62 m

b) 64 m

c) 57 m

d) 67 m



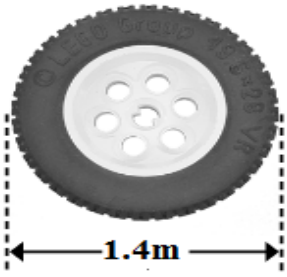
13. If the wheel below completes 12 revolutions, **how far (distance)** will it go?

a) 8.8 m

b) 880 m

c) 105.6 m

d) 52.8 m



Trigonometric functions

14. If $CosB = \frac{3}{5}$, find $SinB$ 2019 p1

a) $\frac{1}{5}$

b) $\frac{3}{4}$

c) $\frac{1}{4}$

d) $\frac{4}{5}$

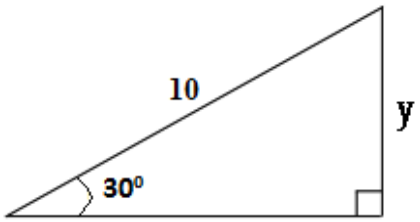
15. Find the length of the side marked y:

a) 6

b) 5

c) 10

d) 11



16. Find the value of $Cos^2x = 1 - Sin^2x$ 2019 p1

a) $-\frac{1}{2}$

b) $\frac{1}{2}$

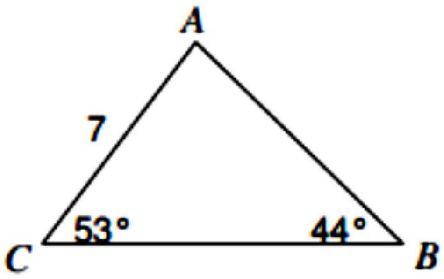
c) -1

d) 1

17. Evaluate $Cot\ 135$ 2019 p1

a) 1

b) -1



c) $-\frac{\sqrt{2}}{2}$

d) $\frac{\sqrt{2}}{2}$

18. Find the length of side AB

a) 10

b) 8

c) 6.1

d) 4.9

19. The expression $\frac{\sin \emptyset}{\sqrt{1-cos^2\emptyset}}$ simplifies to:

a) $\sin \emptyset$

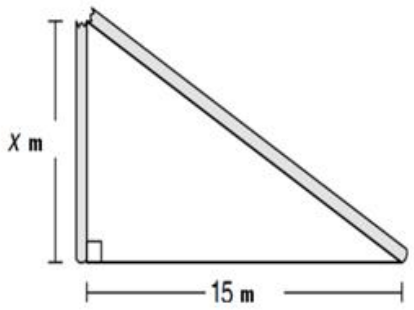
b) 0

c) 1

d) $\tan \emptyset$

Trigonometric functions

20. A wooden pole was broken during a wind storm in Burao. Before it broke, the height of the pole above the ground was **25 m.** After it broke, the top of the pole touched the ground 15m from the base.



How tall was the part of the pole that was left standing?

A. 8 m
B. 10 m
C. 17 m
D. 20 m

21. If 6 $sinx = 3cosx$, the value of $tanx$ is:

a) $\frac{6}{3}$
b) $-\frac{3}{6}$
c) 2
d) $\frac{1}{2}$

22. Express the expression $\frac{1-cos^2x}{cosx}.\frac{1}{sin^2x}$ as a single term

a) csc x
b) Sec x
c) Cot x
d) Tan x

23. Solve: $2cos^2x + cosx = 0$

a) $0, 180^0$
b) 0, 180, 270, 360
c) 0, 90, 270, 360
d) None

24. Solve on the Interval [0,2π) tan(x)+1=2

a) 0 and π
b) $\frac{3\pi}{4}$ and $\frac{7\pi}{4}$
c) $\frac{\pi}{4}$ and $\frac{5\pi}{4}$
d) $\frac{3\pi}{4}$ and $\frac{5\pi}{4}$

25. $2sin^2x - sinx = 0$

e) 0, π, 2π
f) π/2, 3π/2
g) 0, π/6, 5π/6, π, 2π
h) π/3, 2π/3, 2π

Trigonometric functions

26. Simplify $cos^2\theta + tan^2\theta + sin^2\theta$

a) 1 **c)** $1 + tan^2\theta$

b) $1 + cot^2\theta$ **d)** $sin^3\theta$

27. What is the exact value of the $cosecant$ of the angle 45^0?

a) $\frac{\sqrt{2}}{2}$ **c)** $-\frac{\sqrt{2}}{2}$

b) $\sqrt{2}$ **d)** $\frac{\sqrt{3}}{2}$

28. Find out the size of the angles $sin^{-1}(-\frac{\sqrt{3}}{2})$

a) $60^0, 120^0$ **c)** $240^0, 300^0$

b) $60^0, 240^0$ **d)** $120^0, 300^0$

29. What is the exact value of $\sin\left(\frac{3\pi}{4}\right)$?

a) $\frac{3}{\sqrt{2}}$ **c)** $-\frac{\sqrt{2}}{2}$

b) $\frac{\sqrt{2}}{2}$ **d)** 1

30. What is the value of $y = sin\pi - cos\pi$?

a) 0 **c)** 1

b) -1 **d)** $\propto$

31. The expression $\frac{tanx}{secx}$ is equivalent to:

a) $\sin x$ **c)** $\frac{sinx}{cos^2x}$

b) $\frac{cos^2x}{sinx}$ **d)** $\cos x$

36. The expression $1 + tan^2y$ is equivalent:

a) csc^2x **c)** cot^2x

b) sec^2x **d)** 1

37. Which of the following is NOT equal to $cosA$

a) $\frac{coSA}{Cos^2A+sin^2A}$ **c)** $tanA\ cscA$

b) $sinA\ cotA$ **d)** $\frac{1-sin^2A}{cosA}$

Trigonometric functions

38. If $cos\theta = -\frac{4}{5}$ $tan\theta = -\frac{3}{4}$, then $sin\theta$ is equal to:

a) $sin\theta = \frac{4}{5}$ **c)** $sin\theta = -\frac{4}{5}$

b) $sin\theta = \frac{3}{4}$ **d)** $sin\theta = -\frac{3}{4}$

39. If $\sin x = -\frac{12}{13}$ $tanx = -\frac{12}{5}$, then $\cos x$ is equal to:

a) $\cos x = -\frac{5}{13}$ **c)** $sin\theta = \frac{5}{13}$

b) $\cos x = -\frac{12}{13}$ **d)** $sin\theta = \frac{13}{5}$

40. $\sec x\,(\cos x + \sin x)$ is equivalent:

a) $1 + \cot x$ **b)** $1 + \tan x$ **c)** $sec^2\, x$ **d)** $cos^2\, x$

41. $\sec \beta\,(\sin \beta + \cos \beta)$ is equivalent:

a) $1 + \cot \beta$ **b)** $1 + \tan \beta$ **c)** $sin^2\beta$ **d)** $cos^2\, \beta$

45) $\frac{(\sin\theta + \cos\theta)^2}{1 + 2\sin\theta\cos\theta}$

A) $-\sec^2\theta$ B) 0 C) 1 D) $1 - \sin\theta$

46) $\frac{\csc\theta\cot\theta}{\sec\theta}$

A) $\cot^2\theta$ B) $\sec^2\theta$ C) $\csc^2\theta$ D) 1

42) $\frac{\tan\theta}{\cot\theta}$

A) $\cos^3\theta$ B) $\tan^2\theta$ C) $\sec^2\theta$ D) $\sin\theta$

43) $\frac{\cos^2\theta}{\sin^2\theta} + \csc\theta\sin\theta$

A) $\sec^2\theta$ B) $\csc^2\theta$ C) $\tan^2\theta$ D) 1

44) $\csc\theta(\sin\theta + \cos\theta)$

A) $1 + \cot\theta$ B) $\sec\theta\csc\theta$ C) $-2\tan^2\theta$ D) $\sin\theta\tan\theta$

Trigonometric functions

47) $\sin^2\theta + \tan^2\theta + \cos^2\theta$

A) $\sin\theta$ B) $\sec^2\theta$ C) $\cos^3\theta$ D) $\tan^2\theta$

48) $\cos x(\tan^2 x + 1)$

a) $\cos x$ **b)** $\sin x$ **c)** $sex\ x$ **d)** $\csc x$

49) $\tan^2\theta \csc^2\theta$

A) $\tan^2\theta$ B) $\sin\theta$ C) $\sec^2\theta$ D) $\cos^3\theta$

50) $\frac{1}{\cot^2\theta} + \sec\theta\cos\theta$

A) 1 B) $\sec^2\theta$ C) $\tan^2\theta$ D) $\csc^2\theta$

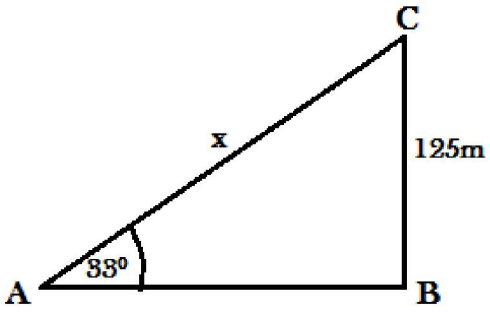
51) $\sin\theta\cos\theta\sec\theta\csc\theta$

A) 1 B) $\csc^2\theta$ C) $\tan^2\theta$ D) $\sec^2\theta$

Trigonometric functions

PART TWO: Structured Questions (workout All the Questions)

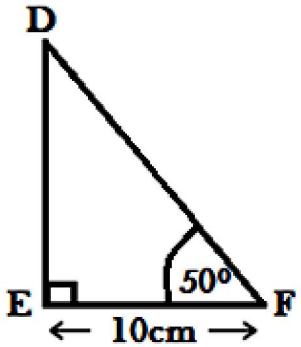
1) *For the triangle below BC* = 125 m. Angle *CAB* = 33°. Find the length of *AC* (marked *x* in the diagram).



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2) The diagram shows a right-angled triangle *DEF*.

EF = 10cm Angle *F* = 50°. Use the table of data to work out the length of *DE*.



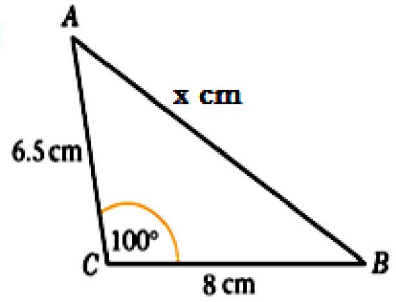
Angle	Sine	Cosine	Tangent
40^0	0.643	0.766	0.839
50^0	0.766	0.643	1.192

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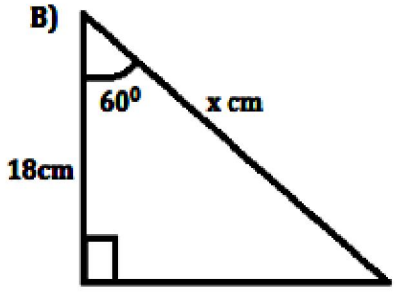
Trigonometric functions

3) For each of the following triangles find the **length of the sides marked** x cm.

A)



B)



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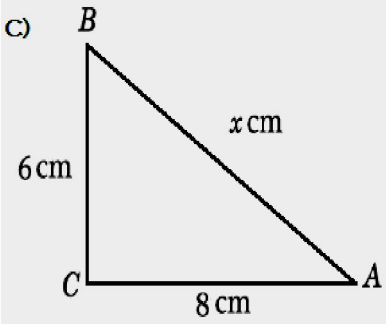
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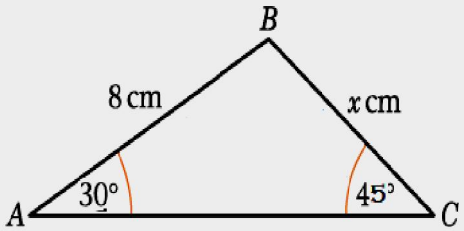
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C)



D)



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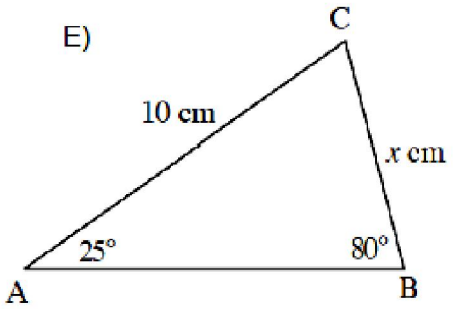
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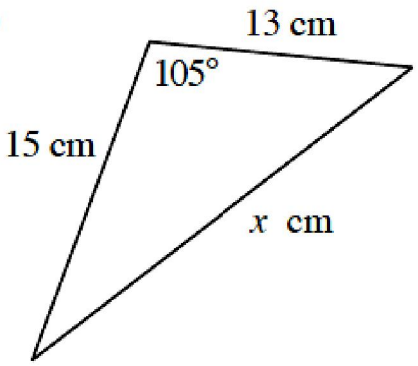
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Trigonometric functions

E)



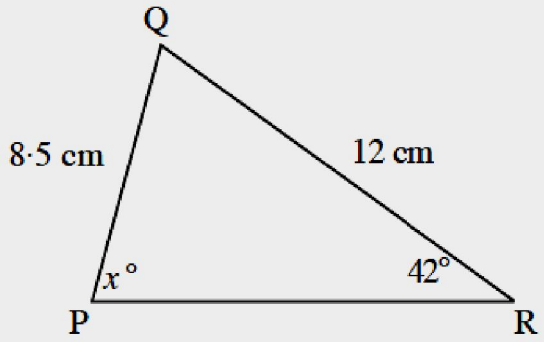
(f)



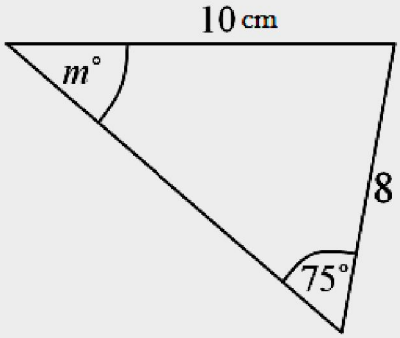
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4) Find the size of the missing **Angles marked** with the letters.

a)



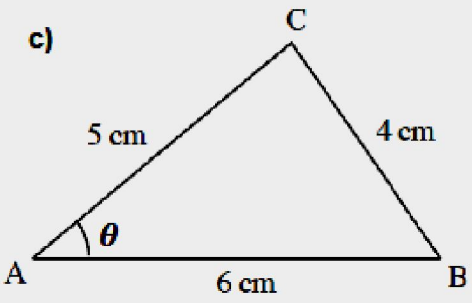
b)



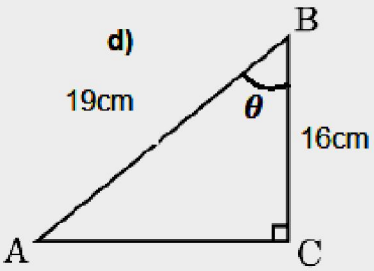
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Trigonometric functions

c)



d)



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5) Evaluate without using a calculator:

a) Cos 150^0 2017 p2 **b)** Tan 300^0

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c) Cot 315^0 **d)** Sin 120^0

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e) Cosec 180^0 **f)** Cot 270^0 **g)** Sec 90^0

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Trigonometric functions

6) Solve each of the following equation in the interval $0^0 \leq x \leq 360^0$.

a) $2sin^2x - 1 = 0$ 2021 p2

b) $2sin^2x - 2 = 0$

c) $4cos^2x = 3$ 2021 p2

d) $2sin^2x - \sqrt{3}sinx = 0$ 2021 p2

e) $2cos^2x + cosx + 1 = 0$ maths key p2

f) $sinx + sinx + 1 = 0$

Trigonometric functions

g) $\tan x = -\sqrt{3}$ **h)** $\operatorname{cosec} x = 2$

End