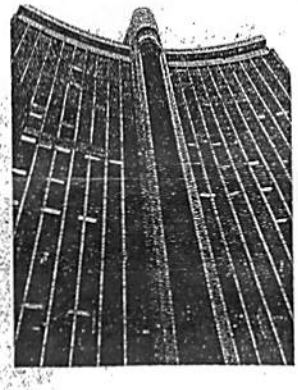
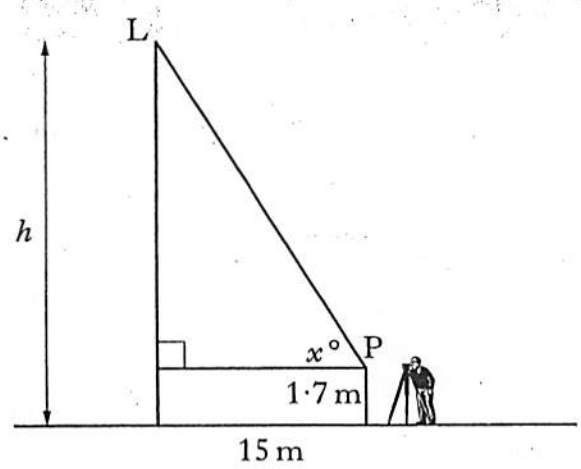
Int 2 2009 - 2011 Trig. graphs & equations

E 2010 P2

14. A surveyor views a lift as it travels up the outside of a building.



In the diagram below, the point L represents the lift.



The height, h metres, of the lift above the ground is given by the formula

$$h = 15 \tan x° + 1{\cdot}7,$$

where $x°$ is the angle of elevation of the lift from the surveyor at point P.

(*a*) What is the height of the lift above the ground when the angle of elevation from P is 25 °? 2

(*b*) What is the angle of elevation at point P when the height of the lift above the ground is 18·4 metres? 3

Int 2 2009-2011 Trig. graphs & equations

2009 P1

A 6. An angle, $a°$, can be described by the following statements.

- a is greater than 0 and less than 360
- $\sin a°$ is negative
- $\cos a°$ is positive
- $\tan a°$ is negative

Write down a possible value for a. 1

2009 P1

B 8. Sketch the graph of $y = 4\cos 2x°$, $0 \leq x \leq 360$. 3

2009 P1

C 10. Simplify

$$\frac{\cos^3 x°}{1-\sin^2 x°}.$$ 2

2011 P2

D 10. Solve the equation

$$2\tan x° - 3 = 5, \quad 0 \leq x \leq 360.$$ 3

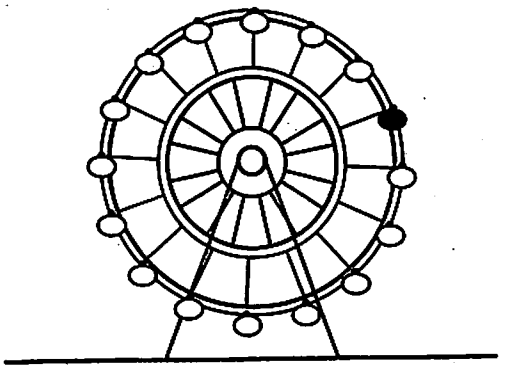
Int 2 - Solving trig. equations 2002-2008

2002 P2

12. At the carnival, the height, H metres, of a carriage on the big wheel above the ground is given by the formula

$$H = 10 + 5\sin t°,$$

t seconds after starting to turn.



(*a*) Find the height of the carriage above the ground after 10 seconds. 2

(*b*) Find the **two** times during the first turn of the wheel when the carriage is 12·5 metres above the ground. 4

2003 P2

12. (*a*) Solve the equation

$$2\tan x° + 7 = 0, \qquad 0 \leq x < 360.$$ 3

(*b*) Prove that

$$\sin^3 x° + \sin x° \cos^2 x° = \sin x°.$$ 2

2004 P2

10. Solve the following equation for $0 \leq x \leq 360$.

$$7\sin x° - 3 = 0$$ 3

2005 P1

6. Given that

$$\tan 45° = 1,$$

what is the value of $\tan 135°$? 1

Int 2 - Solving trig. equations 2002-2007

2005 P2

11. (*a*) Solve the equation

$$7\cos x° - 5 = 0, \qquad 0 \leq x < 360.$$

3

(*b*) Simplify

$$\tan x° \cos x°.$$

2

2006 P1

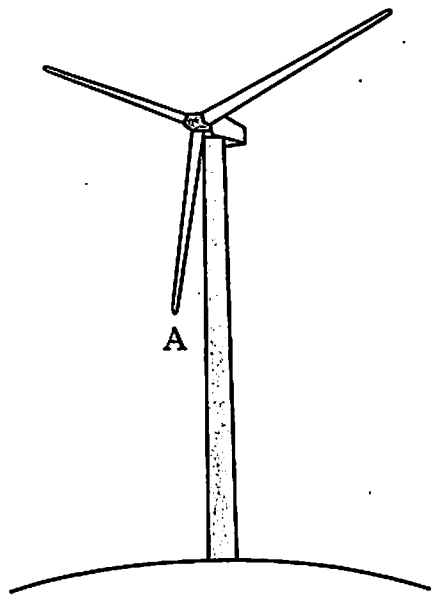
6. Write the following in order of size, **starting with the smallest.**

$$\sin 0° \qquad \sin 30° \qquad \sin 200°$$

Give a reason for your answer. 2

2006 P2

12. The arms on a wind turbine rotate at a steady rate.



The height, h metres, of a point A above the ground at time t seconds is given by the equation

$$h = 8 + 4\sin t°.$$

(*a*) Calculate the height of point A at time 30 seconds. 2

(*b*) Find the **two** times during the first turn of the arms when point A is at a height of 10·5 metres. 4

Int. 2 - Solving trig. equations 2002 - 2008

2007 P1

8. Given that

$$\cos 60° = 0{\cdot}5,$$

what is the value of $\cos 240°$? 1

2007 P2

13. Solve the equation

$$5 \tan x° - 6 = 2, \qquad 0 \leq x < 360.$$ 3

2008 P1

10. If $\sin x° = \frac{4}{5}$ and $\cos x° = \frac{3}{5}$, calculate the value of $\tan x°$. 2

2008 P2

8. Solve the equation

$$4 \cos x° + 3 = 0, \qquad 0 \leq x \leq 360.$$ 3