BESTMATHS.NET

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Diamond Princess

The **Diamond Princess** is a cruise ship operated by **Princess Cruises.**

- The ship was built in 2004 and cost US$500 million.
- The ship is 290.2 metres or 952 feet long and its beam (the most extreme width, or breadth, of a nautical vessel) is 37.49 metres or 123 ft.
- Its gross tonnage is 115, 875 GT.
- The ship carries 2674 passengers and 1238 crew.
- The ship has 15 floors.
- The ship can travel at 22 knots (41 km/h or 25 miles per hour)
- It was built in Nagasaki, Japan by Mitsubishi Heavy Industries.
- Princess Cruises own 15 other ships. The biggest and newest of these is the **Royal Princess** which will launch in June, 2013 and will have a gross tonnage of 141, 000 GT.

Some Questions about the Ship

1. The distance from Melbourne to Sydney, in Australia by sea is 548 nautical miles. If the **Diamond Princess** sails at an average speed of 16.9 knots. How long in hours and minutes does the journey take?

2. Calculate the speed of this journey in km/h.

3. How is the gross tonnage of a ship calculated ?

4. What is the percentage increase between the gross tonnage of the **Royal Princess** and the **Diamond Princess**?

Answers at bottom of Page 2

Numbers in the News

Asteroid

An asteroid named **Toutatis** made a close visit to the Earth in December 2004. (Next visit 2069)

Toutatis is about 4.5 km long and 2.4 km wide and weighs about 5×10^{13} kg

It travels at 22 000 miles per hour and came within 18 lunar distances of Earth. It was a long way from Earth but if it hit...

1 lunar distance is 384 000 km.

The Maths Joke

Question:

How many seconds are there in a year?

Answer 12

(January 2nd, February 2nd...)

BestMaths News

Our first Game **BestMaths Number Nightmare** will be available from the Apple App Store before the end of January.

150 **IGCSE (14-16 years) Questions** are available in PDF form with full solutions at www.bestmaths.net

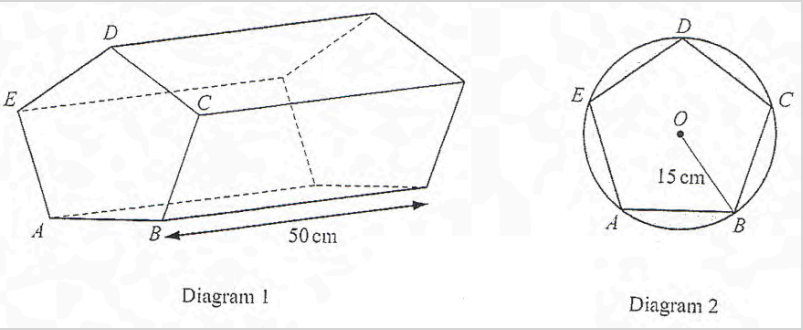
BestMaths IGCSE Tester available ***now*** in the Apple App Store.

Number Quiz

1. What is the seventh prime number?
2. What is the 4th cube number?
3. Give 0.90909 to 3 significant figures.
4. Write one thousandth in standard form.
5. Calculate 10 divided by 1/5 .

Answers at bottom of Page 2

Exam Question Challenge



What is the volume of the prism shown above?

Send solution to ro@bestmaths.net

Prize for best set-out correct answer.

Problem of the Month

In a family a boy has as many sisters as brothers, but each sister has only half as many sisters as brothers.

How many boys and girls are there in the family?

Answer in NEXT issue

Symmetry in Prague

Number of 24 the Month

24 is a the number of hours in a day

24 is the 4th **factorial number**

4! = 4 x 3 x 2 x 1 = 24.

24 is divisible by the sum of its digits and their product

i.e. **24** ÷ 6 = 4 and **24** ÷ 8 = 3

Formula of the Month

The surface area of a sphere

$$S = 4\pi r^2$$

where r = radius of the sphere

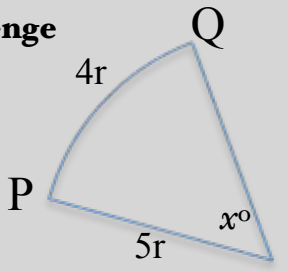
Answer to last month's Exam Question Challenge

The diagram shows a sector of a circle,

The centre is O and the radius is 5r.

The length of the arc PQ is 4r.

Find the area of the sector **in terms of r.**



Answer

$$Circumference = \pi \times d = \pi \times 10r = 10\pi r$$

$$\frac{PQ}{Circumference} = \frac{x}{360}$$

$$\frac{4r}{10\pi r} = \frac{x}{360}$$

$$x = \frac{360 \times 4r}{10\pi r} = 45.8^o$$

$$\frac{\text{Area of sector}}{\text{Area of circle}} = \frac{\text{Angle of sector}}{\text{Angle of circle}}$$

$$\frac{A}{\pi(5r)^2} = \frac{45.8}{360}$$

$$A = \frac{45.8 \times 25\pi r^2}{360} = 10r$$

Last month's The Steps Problem

Tom walks up a staircase.Each time he can either take one step or two steps. How many ways are there for Tom to walk up a ten-step staircase?

Answer

The number of ways of walking up the stairs forms a sequence. 1, 2, 3, 5, 8, 13, ...Each term is the sum of the previous two. So continuing to the tenth term

1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...

There would be 89 ways.

Answers to **Some questions about the Ship**

1. 32 hours and 26 minutes

2. 31.5 km/hr

3. It is a unitless index related to the ship's overall internal volume.

4. 22%

Answers to **Number Quiz**

1. 17

2. 64

3. 0.909

4. 1.0×10^{-3}

5. 50

BestMaths Digest is published on the 15th day of each month.