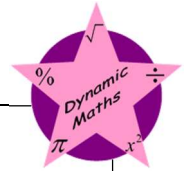


National 5 Applications of Maths: Converting Units of Measure



<u>LENGTH</u>	1 mile = 1·609 kilometres 1 nautical mile = 1·852 kilometres 1 inch = 2·54 centimetres 1 furlong = 201·168 metres 1 yard = 0·9144 metres 1 fathom = 1·8288 metres 1 light-year = 9·46 trillion km 1 foot = 12 inches	<u>MASS/ WEIGHT</u>	1 stone = 14 pounds 1 ounce = 28·35 grams 1 stone = 6·35 kilograms
		<u>DIGITAL INFORMATION (SSD)</u>	1 kilobyte (kB) = 1024 bytes 1 megabyte (MB) = 1024 kB 1 gigabyte (GB) = 1024 MB
<u>VOLUME</u>	1 gallon = 4·545 litres 1 pint = 568·26 millilitres 1 barrel (oil) = 158·99 litres	<u>AREA</u>	1 acre = 4046·86 square metres
<u>SPEED</u>	1 kilometre per hour = 0·54 knots	<u>PRESSURE</u>	1 bar (kPa) = 14·5038 psi

Section A: conversions (round answers to 3 decimal places if needed)

- | | |
|---------------------------------------|-----------------------------------|
| 1. 3 gallons = _____ litres | 17. 4500 ml = _____ litres |
| 2. 3 litres = _____ gallons | 18. 450 ml = _____ litres |
| 3. 4 miles = _____ kilometres | 19. 2·05 litres = _____ ml |
| 4. 12 stone = _____ kilograms | 20. 50 kilometres = _____ metres |
| 5. 12 kilograms = _____ stone | 21. 0·5 kilometres = _____ metres |
| 6. 1475 ml = _____ pints | 22. 3·7 kilometres = _____ metres |
| 7. 1475 pints = _____ ml | 23. 0·25 hours = _____ minutes |
| 8. 10 000 square metres = _____ acres | 24. 5·7 minutes = _____ seconds |
| 9. 1500 metres = _____ furlongs | 25. 12 minutes = _____ hours |
| 10. 32·4 Gigabytes = _____ MB | 26. 4·08 kg = _____ grams |
| 11. 6656 Kilobytes = _____ MB | |
| 12. 290 076 psi = _____ kPa | |
| 13. 12·98 nautical miles = _____ km | |

Harder requiring two facts (round all to 1 decimal place)

27. 26 pints = _____ gallons
28. 320 000 g = _____ stone
29. 1·98 metres = _____ inches
30. 7·08 km = _____ yards
31. 3·5 GB = _____ bytes
32. 20 000 cm = _____ fathoms

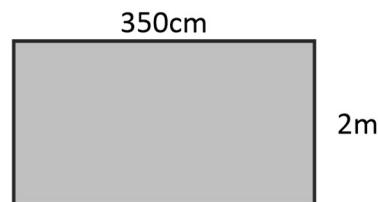
Metric (you need to know the key facts)

14. 5 kilometres = _____ metres
15. 12·5 hours = _____ minutes
16. 1605 minutes = _____ hours

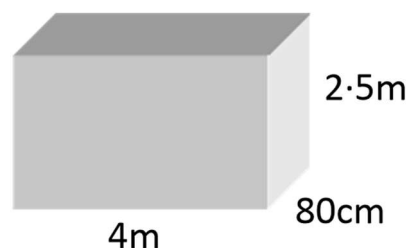
Section B: converting as part of other questions

For metric measures, you need to know the conversion facts. For other conversions, use the information given in the table above.

1. The diagram shows a rectangular room that requires to be covered in carpet. Calculate the area of the room **in square metres**.



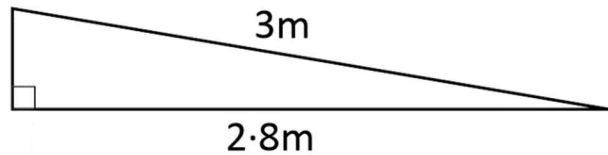
2. Darren is travelling from North Berwick to Dunbar. The direct distance from North Berwick to Dunbar is 14.5 kilometres. Google Maps says that the quickest journey by car is 12.1 miles. Calculate how much longer the quickest car journey is than the direct distance. Give your answer in **miles**, rounded to 2 decimal places.
3. Adult African elephants typically weigh 4-6 tonnes each. Baby elephant calves typically weigh 100kg each. Calculate the total typical weight of a herd of six adult elephants and eleven calves.
4. A shelf in a supermarket is 135cm long. It is used to display boxes of cereal which are each 125mm wide. How many boxes of cereal can be fitted lengthwise along the shelf?
5. A brewery produces 3500 litres of beer per day. How many **pints** of beer can be made from 3500 litres? Give your answer correct to 3 significant figures.
6. Football Association rules are that the smallest possible length for a football pitch is 100 yards. A school playing field is 680 metres long. What is the maximum number of football pitches that could be fitted into this length?
7. A standard hospital operating table can hold a maximum weight of 185kg. Shania weighs 28 stone. Determine whether she is able to be operated on a standard operating table. Justify your answer.
8. Dave is 5 foot 10 inches tall. Denise is 174cm tall. Determine who is taller. Explain your answer.
9. The diagram shows a water tank in the shape of a cuboid.
- a) Calculate the volume of the water tank **in cubic centimetres**.
- b) Convert your answer to part (a) to **litres**.



10. Nancy is a five-year old child. Last year she weighed 3.5 stone. This year she weighs 26kg. Calculate the increase in her weight. Give your answer in kilograms.

11. The volume of oil is typically measured in barrels. The conversion factor for barrels and litres can be found in the table at the start of this worksheet. How many full barrels can be made from **nine and a half thousand litres** of oil?

12. The diagram shows a side-view of a wheelchair ramp. Use Pythagoras' Theorem to calculate the height of the ramp in **centimetres** correct to 3 significant figures.



13. Journeys at sea are often measured in nautical miles, rather than miles. The journey by ferry from Italy to Greece is 125 nautical miles. The same journey by air is 108 (regular) miles. Determine which journey is longer.

14. The lengths of horse races are traditionally measured in furlongs. The Derby is run over a distance of 1 mile 4 furlongs. What is the total distance of the race in **metres**? Give your answer correct to 2 significant figures.

15. Fathoms are a unit of measurement traditionally used to measure depth at sea. The wreck of the Titanic lies about 2100 fathoms below sea level. How deep is this in **kilometres** correct to 2 significant figures?

16. A blood donation bank has a daily target of 200 litres of blood. In one day, 376 blood donors each donate 1 pint of blood. Determine whether the blood donation bank have met their target. Explain your answer.

17. Lisa owns a farm. She buys a sheep weighing $8\frac{1}{2}$ stone. How many **pounds** does the sheep weigh?

18. Stephen buys 2 pints of milk from the supermarket. He uses it to make coffee. He puts 30 millilitres of milk into each cup of coffee he makes. Calculate how many cups of coffee he can make using 2 pints of milk.

19. In 1900 in Britain, average tea consumption was 2.3 pints per day. In 2000 in Britain, average tea consumption was 960ml per day. Determine whether this was an increase or a decrease and calculate the percentage increase/decrease. Give your answer correct to 1 decimal place.

20. The speed of ships is traditionally measured in knots. Oil tankers at sea typically travel at a speed of about 12 knots. Lorries carrying oil on land have a speed limit of 50 kilometres per hour. Determine which mode of transport is fastest: sea or land. Explain your answer.

21. (2017 Paper 2 Questions 5ab) It takes 7 hours 30 minutes to make a journey of 240 kilometres by ship. Calculate the average speed of the ship's journey. Give your answer in **knots**, rounded to 2 significant figures.

22. (Dynamic Maths past prelim question) Trevor is a lorry driver on a farm. He is driving a truck containing 18 young pigs over an old bridge. The bridge has a warning sign at its entrance.

DANGER
MAXIMUM WEIGHT
600 stones

Each of the pigs in Trevor's trucks could weigh anything up to 85kg. Trevor's truck weighs 2500kg. Trevor weighs 90kg. There is no other weight on the truck other than Trevor and the pigs.

Determine whether Trevor can safely drive the truck over the bridge with 18 pigs on board the truck. Explain your answer.

23. (2017 Paper 1 Question 5) Jane is trying to improve the number of pull ups she can do. She looks online for pull up assistance bands.

There are seven bands named 'A' to 'G'. Jane finds a table explaining what type of bands she should use based on her weight and the number of unassisted pull ups she can do. The table is shown below.

Unassisted pull ups	Body Weight (pounds)					
	90–120	121–150	151–200	201–250	251–300	300+
0–4	D	D and A	E	F	F	G and A
5–8	C and A	D	E	E	E and B	G
9–11	C	D	D and C	E	E and A	F
12–15	C	C and B	D and B	D and C	E	E and C
16–20	B	C	D	D and B	E	E

Jane weighs herself. She weighs 11 stone and 5 pounds. Jane can do 10 unassisted pull ups. Determine which band(s) the table recommends that Jane should buy.

24. (2018 Paper 2 Question 7) Sam drive from Paris in France to Zurich in Switzerland. He knows:
- His car will cover an average of 47 miles per gallon of fuel
 - The fuel tank holds 50 litres of fuel when it is full
 - It is 650km from Paris to Zurich.

Determine whether Sam will be able to complete his journey with one full tank of fuel. Use your working to justify your answer.