



SPRINGBURN ACADEMY



MATHS DEPARTMENT



N5 LIFESKILLS

Exam Style Questions

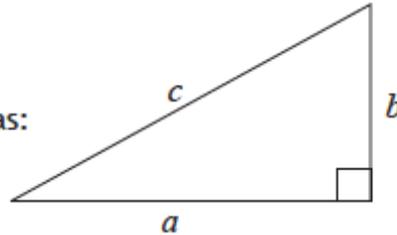
N5

FORMULA LIST

Circumference of a circle: $C = \pi d$

Area of a circle: $A = \pi r^2$

Theorem of Pythagoras:



$$a^2 + b^2 = c^2$$

Volume of a cylinder: $V = \pi r^2 h$

Volume of a prism: $V = Ah$

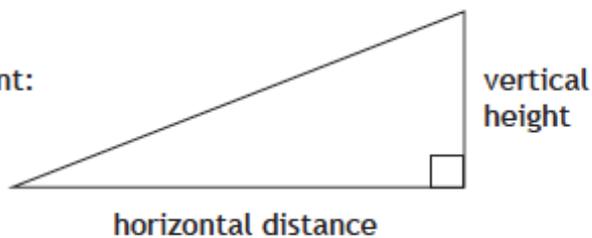
Volume of a cone: $V = \frac{1}{3} \pi r^2 h$

Volume of a sphere: $V = \frac{4}{3} \pi r^3$

Standard deviation:

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}} = \sqrt{\frac{\sum x^2 - (\sum x)^2 / n}{n-1}}, \text{ where } n \text{ is the sample size}$$

Gradient:



$$\text{gradient} = \frac{\text{vertical height}}{\text{horizontal distance}}$$

PAPER 1 QUESTIONS

(Non Calculator)

1. Ricky buys a pre-owned car for £4000. The value of the car depreciates at the rate of 10% per annum.
How much will the car be worth at the end of 3 years?

2. The data shows the length of films on TV during one weekend in July.

145	120	110	105	105
100	95	100	100	115
90	115	130	105	100

- (a) Show this information in a box-plot.
- (b) Write down the semi-interquartile range for this data set.
- (c) What is the probability that a film chosen at random will last less than 100 minutes.
3. A formula for calculating the time for each stage of a project is

$$\text{time} = \frac{\text{shortest time} + 4 \times \text{likely time} + \text{longest time}}{6}$$

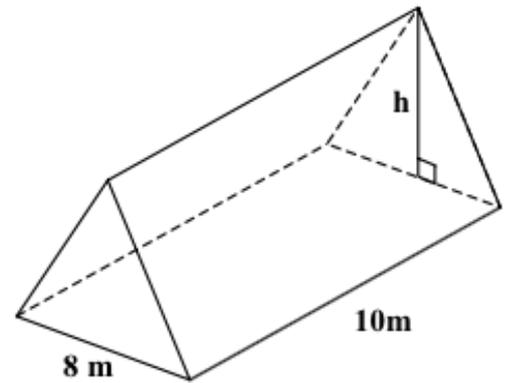
Calculate the time for a project stage which has a likely time of 12 hours, a shortest time of 7 hours and a longest time of 20 hours.

4. The data below shows the weights (to the nearest kilogram) of 13 of the most capped players in the Scotland rugby squad.

93	109	93	77	101	108	106
114	98	88	103	104	108	

- (a) Show this information in a box-plot.
- (b) Write down the semi-interquartile range for this data set. 1
- (c) What is the probability that a player chosen at random weighs less than 100 kg?

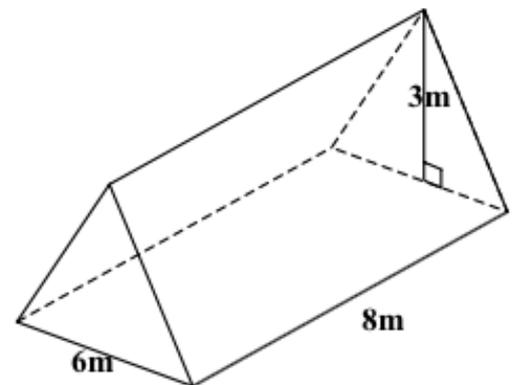
5. The volume of this triangular prism is 200 m^3 . Calculate the height, h .



6. Gareth wants to know the volume of the roof space in his house which is in the shape of a triangular prism.

He makes a sketch and takes these measurements.

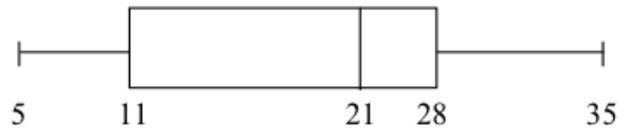
Calculate the volume.



7. Paul earns £5.50 per hour for a 35 hour week. For any extra hours worked he gets paid an overtime rate at time and a half. His deductions are 20% of his gross pay. Calculate his net pay for 40 hours worked.
8. In 1996 an Arab oil company's profit was £8 000 000. In the following two years the profits fell by 10% in the first year and 5% in the next year. What was the company's profit in 1998?
9. Malcolm has a part-time job working a basic 20 hours a week. He gets paid £5.40 an hour. Any overtime at the weekend is paid at the rate of time and a half. Calculate his gross pay in a week when he works his usual 20 hours plus 4 hours on Saturday.

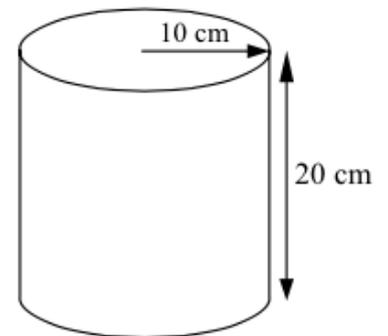
10. A new TV game show has a panel of 20 men and 16 women. Members of the public phone in and ask one of the panel, chosen at random, a question. What is the probability that the first member of the panel chosen to answer a question is a woman?

11. The box plot shows the number of hours of TV watched in a week by a group of students.



Calculate the semi-interquartile range.

12. The diagram shows a cylinder with radius 10 centimetres and height 20 centimetres. Taking $\pi = 3.14$, calculate the volume of the cylinder.



13. Tonya earns £8500 in a year. She has tax allowances totaling £4500 and pays tax on the remainder at a rate of 20%. Calculate how much tax Tonya will pay in a year.
14. A bag of wine gums has 5 black, 6 red, 4 yellow, 5 orange and 4 green sweets. What is the probability that one picked out at random is not yellow?

PAPER 2 QUESTIONS

(Calculator)

1. The number of people who own mobile phones is approximately 30 million. If the number of people owning a phone is increasing at the rate of 4.2% each year, how many people will be own a mobile phone in 3 years time?
Give your answer to the nearest million.

2. A quality control examiner on a production line measures the weight in grams of cakes coming off the line. In a sample of eight cakes the weights were

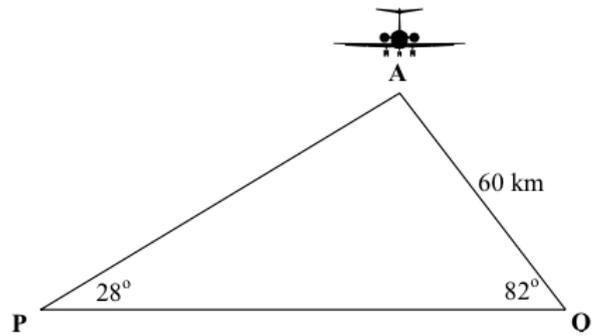
150 147 148 153 149 143 145 151

- (a) Use appropriate formulae to calculate the mean and standard deviation. Show all your working clearly.
- (b) On a second production line, a sample of 8 cakes gives a mean of 149 and a standard deviation of 6.1. Compare the two production lines?
3. Paul works a 7-hour day from Monday to Friday. Weekday overtime is paid at time and a half and Saturday at double time. His hourly rate is £5.20. The table below shows the hours he worked in a week in December.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7	9	10½	11	7	5

- (a) Calculate Paul's pay for a basic 5-day week.
- (b) How much does Paul earn in overtime?
- (c) Calculate his gross wage for this week.
- (d) In this week Paul's deductions were:
Tax £56.24, National Insurance £16.71, Superannuation £31.59.
Calculate his net pay.

4. An aircraft, A, is picked up by two radar stations, P and Q. The aircraft is 60 km from station Q.

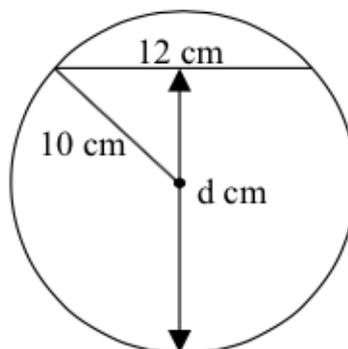


- (a) Calculate the distance between station P and station Q.
- (b) Calculate the area of triangle APQ.

5. Maria has a gross pay of £23400. Last year her allowances were £7020. This year, with tax changes, her allowances are £4560. If tax is paid at the rates shown in the table, how much extra tax will she have to pay this year?

	rate of tax
lower rate	20% on the first £4300
basic rate	23% on the next £22800
higher rate	40% on the income over £27100

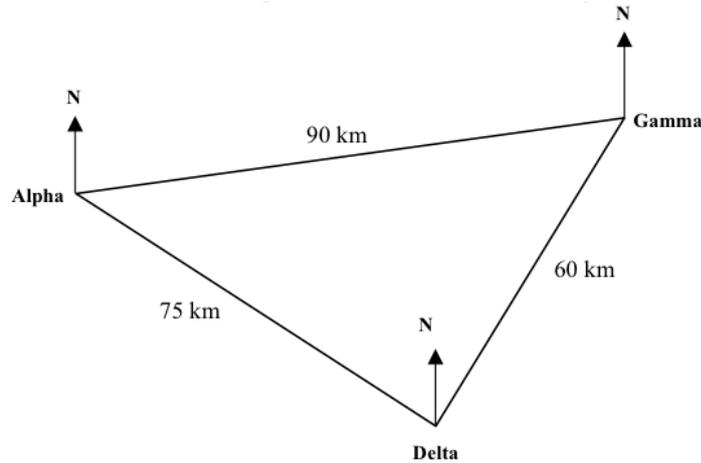
6. A goldfish bowl is filled with water to a certain level. A cross section through the centre of the bowl is circular.



If the width of the water surface is 12 cm and the radius is 10 cm, find the depth of the water, d cm, in the bowl.

7. The surface area of a sphere is calculated using the formula $A = 4\pi r^2$
- What radius would give a sphere with a surface area of 2827 cm^2 ?
- (Give your answer to the nearest centimetre)

8. Three oil platforms, Alpha, Gamma and Delta are situated in the North Sea as shown in the diagram below. The distances between the oil platforms are shown in the diagram.



If the bearing of Delta from Alpha is 125° , what is the bearing of Gamma from Alpha?

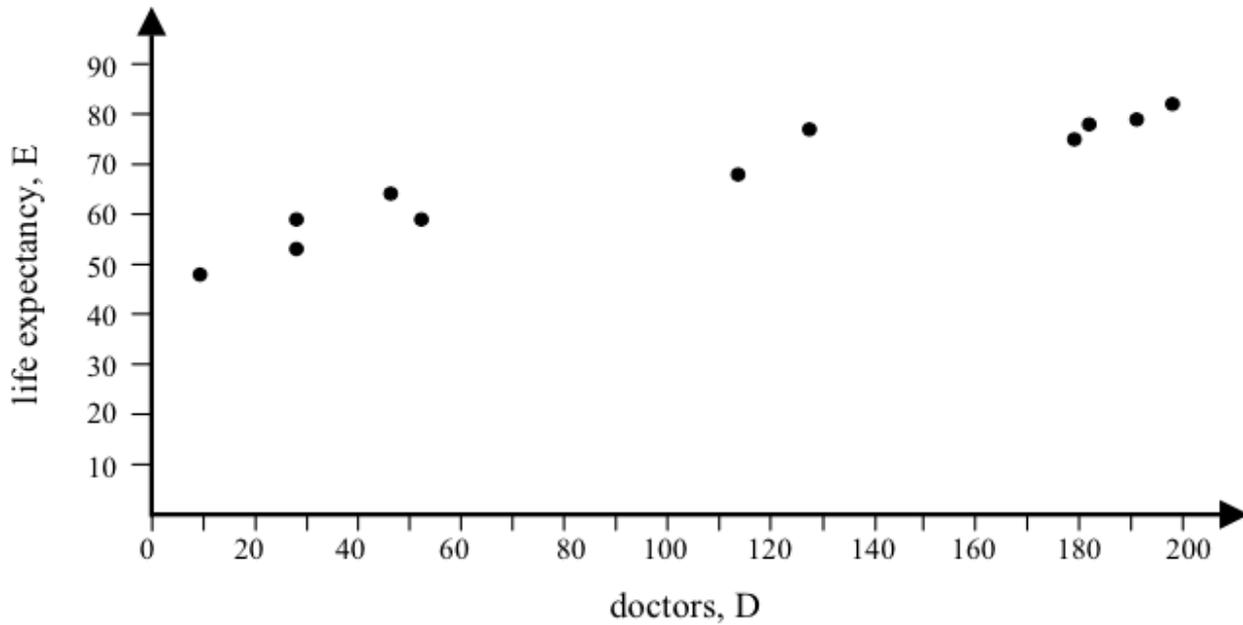
9. The loan table below shows the monthly repayments for borrowing different amounts from a finance company.

loan amount	60 months		48 months		36 months		24 months	
	with	without	with	without	with	without	with	without
7.9% APR for loans between £5000 and £20000								
£20000	410.01	402.33	492.27	485.12	633.62	623.64	989.81	901.49
£15000	352.51	301.75	418.70	363.84	520.22	467.73	742.36	676.12
£10000	234.00	211.16	279.14	242.56	346.81	311.82	494.91	450.75
£8000	188.00	160.93	223.31	194.05	277.55	249.46	395.93	360.60
£5000	117.50	100.58	139.57	121.28	173.41	155.91	247.45	225.37
12.5% APR for loans between £2500 and £4999								
£4500	118.65	99.81	133.77	118.22	167.12	149.19	233.27	211.56
£2500	65.92	55.45	76.54	65.68	92.84	82.88	129.59	117.53
17% APR for loans between £1000 and £2499								
£2000	58.56	48.41	66.62	56.46	79.07	70.10	108.18	97.72
£1000	29.27	24.20	33.31	28.23	39.53	35.05	54.09	48.86

- (a) You can afford to pay between £60 and £70 a month. What are the different amounts you could borrow and over how long?
- (b) Calculate the cost of a loan of £5000 over 36 months with loan protection.

10. The table and graph below show the relationship between the number of doctors per 10 000 of population (D) and life expectancy (E) in eleven countries.

doctors, D	9	28	28	47	53	113	128	179	182	191	198
life expectancy, E	48	53	59	64	59	68	77	75	78	79	82



- Draw the line of best fit onto the diagram.
- Find the equation of the line of best fit.
- Use your answer to part (b) to predict the life expectancy in a country which has 80 doctors per 10 000 of population.

11. Martin has an Express credit card. Here is one of his monthly statements.

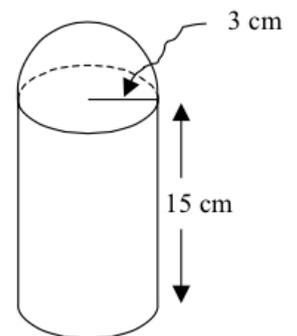
		Credit Card Statement		
		ACCOUNT NUMBER: 2243 7501 8045 1722		STATEMENT DATE 11/11/99

DATE OF TRANSACTION	DATE ENTERED	REFERENCE NUMBER	DESCRIPTION	AMOUNT
13/03/03	13/03/03	AB9123	Balance from previous statement	1195.27
			Payment Received – Thank You	210.00

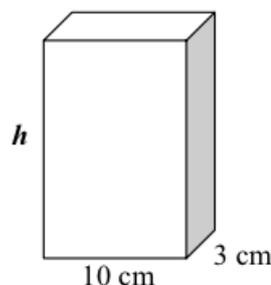
			Balance brought forward	985.27
15/03/03	17/03/03	QL0054	Paulo's Pizza Place	16.32
18/03/03	19/03/03	BM051	Game Gear Megastore	98.49
27/03/03	30/03/03	XZ2012	World of PCs	216.50
04/03/03	07/03/03	YU903	Online Auctions	104.00
CREDIT LIMIT		AVAILABLE CREDIT	MINIMUM PAYMENT	TO REACH US BY
£2500				15/04/03
				PRESENT BALANCE

- (a) What should his present balance be ?
- (b) His repayment is £5 or 5% of her balance, whichever is the larger. How much should his minimum payment be this month ?
- (c) What is his available credit?
12. A soft drinks company makes juice cartons in the form of a cylinder with a hemispherical top.

The radius is 3 cm. The height of the cylinder is 15 cm.

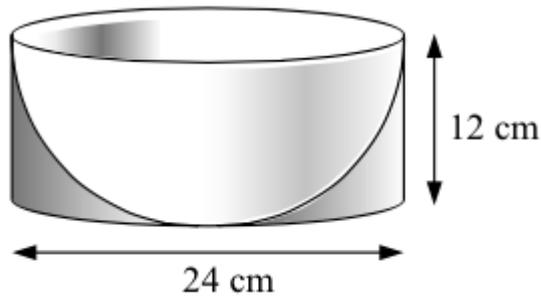


- (a) Calculate the volume of the flask.
- (b) The firm decides to make cartons in the shape of a cuboid which will still hold the same volume of juice.



Given that the base measures 10 cm by 3 cm, what will the height need to be?

13. A glass serving dish is in the shape of a cylinder with a hemisphere of glass removed. Calculate the volume of glass in the dish.



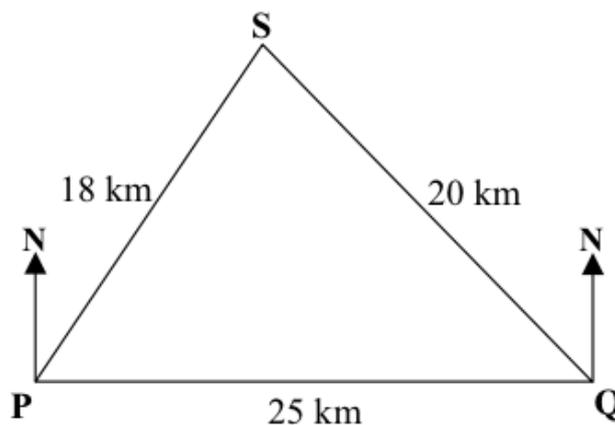
14. Tax is paid at the rates shown in the table below.

	rate of tax
lower rate	20% on the first £4300
basic rate	23% on the next £22800
higher rate	40% on the income over £27100

Kathy had a gross pay of £25800 last year and allowances of £8130. This year, she received a 10% pay rise but her allowances are reduced to £5860.

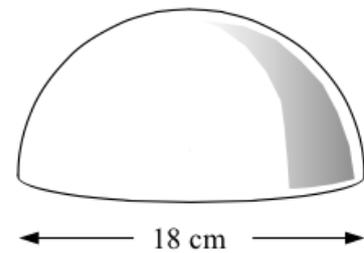
If tax is paid at the rates shown in the table, how much extra tax will she have to pay this year?

15. Two coastguard stations, P and Q, are 25 km apart. Q is due East of P. A ship, S, is at a distance of 18 km from P and 20 km from Q.



- (a) Calculate the size of angle SPQ.
 (b) Hence calculate the bearing of the ship S from station P.

16. A lime-flavoured jelly is in the shape of a hemisphere. The diameter is 18 centimetres. As the jelly sits in a warm room it begins to melt and loses 5% of its solid volume every hour. What would be the solid volume of the jelly left after 3 hours?



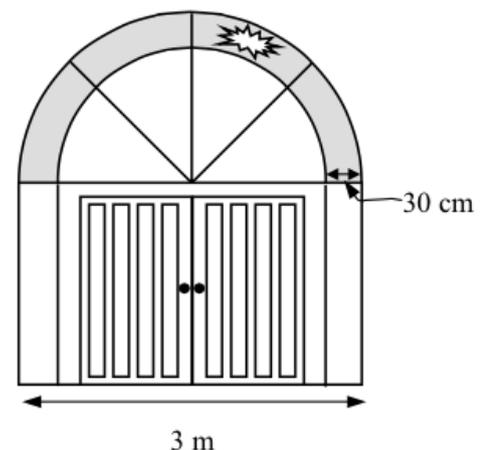
17. Darren is paid a basic salary of £15500 and 3% commission on his sales. His average monthly sales are £8000. Calculate his gross annual salary.
18. Michelle is thinking about opening a new Gold bank account which costs her £10 per month in charges. Included with the account is free travel insurance for the whole family. Michelle is planning two trips abroad for herself and her husband, 2 weeks in Spain and 3 weeks in America. The table below shows the rates of travel insurance.

Prices shown are per person				
all prices are in pounds sterling	UK	Europe	USA	Rest of the world
1 – 5 days	7.60	12.08	25.74	28.37
6 – 11 days	9.01	13.35	28.37	33.32
12 – 20 days	9.01	13.35	28.37	46.90
21 – 30 days	11.17	25.58	44.69	52.83

Will James save money by opening the account? (Give reasons for your answer).

19. The area above a church doorway is made up of a semicircle of plain glass with a semi-circular band of coloured glass above it, as shown. The framework of the door has a width of 3 metres and the band of coloured glass has a width of 30cm. The glass is constructed from four equal sections. One of the pieces of coloured glass has been broken.

Calculate the area of the coloured panel that needs to be replaced.



20. Tax is paid at the rates shown in the table below.

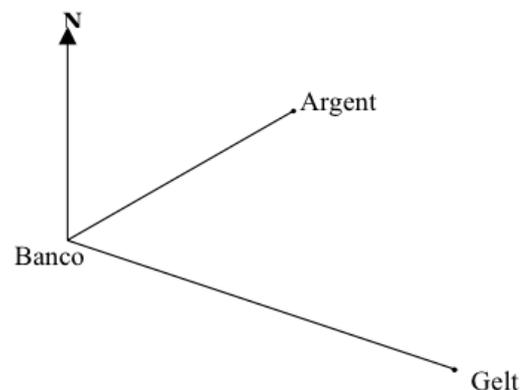
	rate of tax
lower rate	20% on the first £4300
basic rate	23% on the next £22800
higher rate	40% on the income over £27100

Hasan earns £24000 a year and has allowances totalling £3500. How much tax will he pay in a year?

21. Two ships, the Argent and the Gelt leave port Banco at the same time.

The Argent follows a course of 045° for 20 km and the Gelt travels on a course of 108° for 30 km.

Calculate the distance between the two ships.



22. The table shows the monthly repayments on loans for a 5 year period.

Monthly Repayments			
	Without loan protection	With loan protection	With loan protection plus
£25,000	£525.05	£549.80	£599.80
£20,000	£420.04	£439.84	£479.84
£15,000	£315.03	£329.88	£359.88
£12,500	£262.52	£274.90	£299.90
£10,000	£210.02	£219.92	£239.92
£7,500	£157.51	£164.94	£179.94
£5,000	£105.01	£109.96	£119.96
£4,000	£84.01	£87.97	£95.97

Gavin wants to take out a loan of £12 500. How much extra will he pay in total if he chooses loan protection plus instead of just loan protection?