National 4 Non-Calculator Quick Test

1. Round 27.89547 to 2 decimal places. 1

   A 27.895 B 27.89

   C 27.90 D 30

2. Find 3 /7 of £217 2

   93

3. Calculate - 7 - (- 8) 1

   A 15 B 1

   C -15 D -1

4. Calculate 150 ÷ (-3) 1

   - 50

5. Given a = 9 and b = (-7) 3
   Evaluate $3a^2 - b$

   - $3 \times 9^2 - (-7)$
   - $= 243 - (-7)$
   - $= 250$

6. Fred bought a car for £1200 and sold it one year later for £900. 3
   Express his loss as a percentage of the original purchase price.

   - £1200 - £900 = £300 (calculates loss)
   - £300 ÷ £1200 = 1/4 (loss as a fraction of original cost)
   - 1/4 x 100% = 25 % (fraction as percentage)

7. Expand the brackets 2
   4(3x + 4t + 5)

   12x + 16t + 20

8. An aircraft takes off at 21:45 hrs and lands at 02: 33 hrs 2
   How long was the duration of the flight ?

   - 2145 to 2400 = 2hrs 15 mins (calculates time to midnight)
   - 2hrs 15 + 2hrs 33 = 4hrs 48 min

9. A n item is on sale for £3600.
HP is available in store for a deposit of £600 and 12 monthly payments of £280.
How much cheaper is the item if it is paid for by cash ?

3

- 12 × £280 = £3360
- £3360 + £ 600 = £3960
- £3960 - £3600 = £360

The item is £360 cheaper if paid for by cash.

10. Change the subject of the formula
v = u + at to a

2

- v - u = at
- a = (v - u) / t

National 4 Calculator Quick Test

1. A central heating engineer charges twenty six pounds per half hour plus a call out fee of forty pounds to attend faulty systems. 3

   How much does he charge to attend a system which takes 2 ½ hours to repair ?

   - charge = 26 x time + £40
   - charge = 26 x 5 + £40
   - £170

2. Janice is asked to randomly pick two cards from a standard pack of 52 playing cards and place them on a table. 3

   A. What is the probability of her picking a black queen as her first card ? 2
   Fully simplify your answer

   - P(Black queen) = 2/52
   - = 1/26

   B. She picks the six of hearts. 1

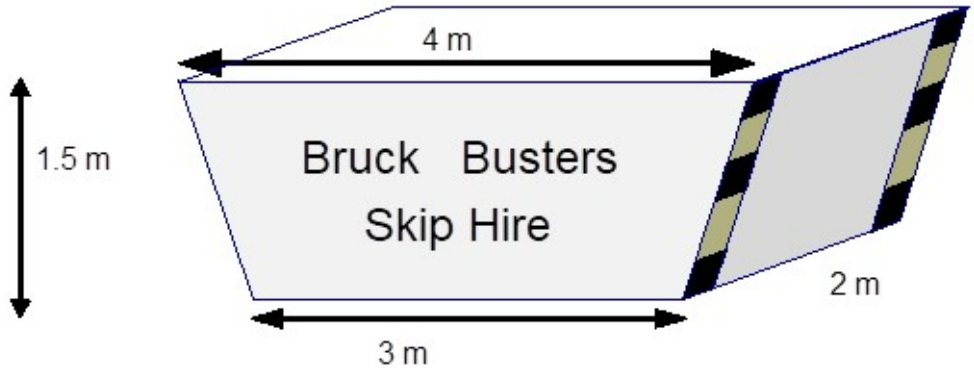
   What is the probability of her now picking a black queen as her second card ?

   P(Black queen) = 2/51

3. Climbing rope is sold by the metre. 5m of rope costs £18.40. 3
   What is the cost of 17m of rope?

   m : £
   - 5 : 18.40
   - 18.40 / 5 = 3.68 £/m
   - 3.68 x 17 = £62.56

4. Bruck Busters operate a small refuse skip hire service. 10
The company owns 132 symmetrical skips with the dimensions as shown in the picture below.



A. Calculate the total volume of the entire fleet of skips. 4

- Area = 1.5x1/2(3+4) = 5.25 m^2 (calculates area of trapezium)

Or 3x1.5 + 2(1/2 x1.5 x0.5) = 5.25m^2 (or splits into composite shapes)

- V =5.25 x 2 (knows to use V=Ah)
- = 10.5 m^3 (correctly calculates volume of one skip)
- Total Volume = 10.5 x 132 = 1386 m^3 (correctly calculates volume of all skips)

B. To conform with new Health & Safety Regulations, each skip must have reflective tape placed vertically on all slanting edges, as shown above. 4

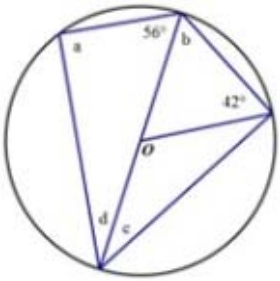
Tony has been given the task of replacing the reflective tape on every skip.
Calculate the length of tape required to cover one edge of a skip.
Give your answer correct to two decimal places.

- RAT drawing, some indication. (knows to use Pythagoras)
- $slope^2 = 1.5^2 + 0.5^2$ (sets up equation correctly
- slope length =1.5811 m (calculates slope length)
- side = 1.58 m (2dp) (rounds correctly)

C. He uses 5m rolls of tape. 2
How many rolls of tape are needed to completely replace the tape on one skip ?

- 1.58 x 4 = 6.32m
- 6.32m>5m so 2 rolls required.

5. Find the missing angles (a,b,c,d)in the picture below: O is the centre of the circle. ____ 4



- a = 90°
- b = 42 °
- c = 48°
- d =34°

6. The following speeds , in miles per hour, were recorded by a police safety camera unit operating on the A96 :- ____ 4

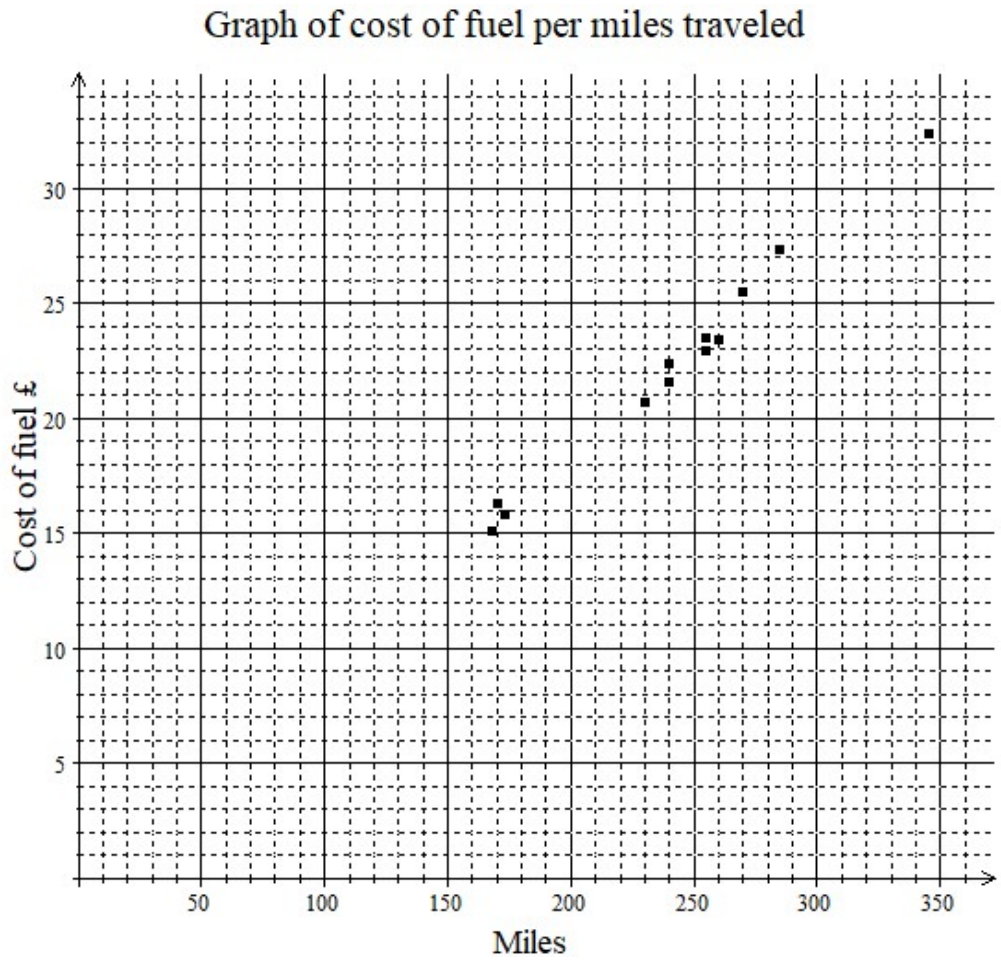
60 66 67 70 58 70 82 47 61 55 64 57 84 71 59

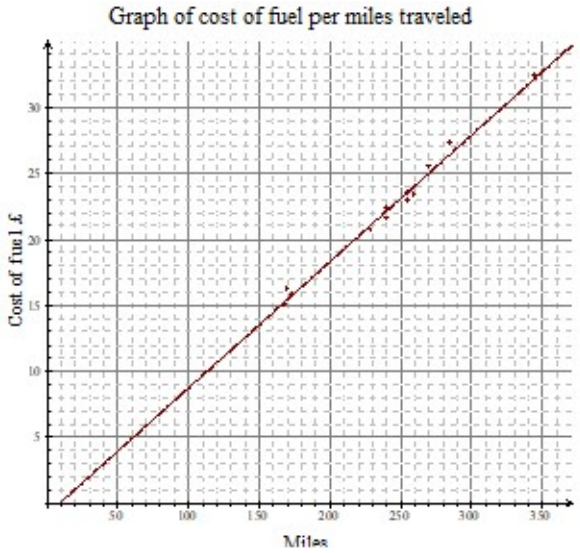
Calculate the Mean, Median, Mode and Range

- Mean = 971/15 = 64.7 mph (1dp)
- Median is 64 mph
- Mode = 70 mph
- Range = 84-47=37mph

7. Draw a line of best fit through the points on the graph and use it to estimate the cost of travelling 200 miles

1





- Draws reasonable line
- cost approximately £18

8. Complete the table for the equation y = -2x +4

2

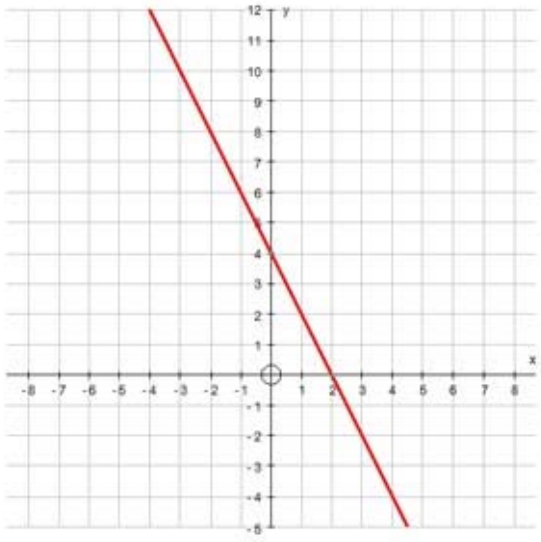
x	-3	-2	-1	0	1	2	3
y							

x	-3	-2	-1	0	1	2	3
y	10	8	6	4	2	0	-2

- 4 values correct
- Remaining values correct

9. Calculate the gradient of the line in the graph below :

2

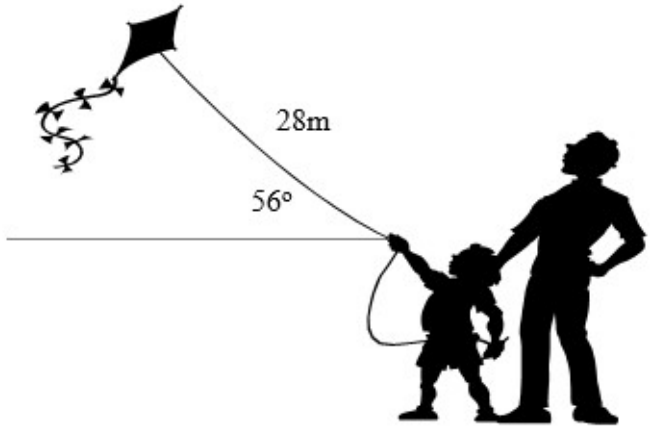


- m = v/h
- m = -4/2 = -2

10. Anna is flying her kite.
The string is 28 m long and is at an angle of 56° to the horizontal.
The kite is held at head height.

3

How high is the kite above her head ?
Give your answer correct to one decimal place.



$$\sin 56^{o} = \frac{Opposite}{Hypotenuse}$$

$$\Rightarrow \sin 56^{o} = \frac{x}{28}$$

$$\Rightarrow 28\sin 56^{o} = x$$
$$\Rightarrow x = 23.21305\ m$$
$$\Rightarrow x = 23.2\ m\ \ (1\text{dp})$$

