N28 Estimating using SF

OCR

(b) Work out an estimate for

$$\frac{32.7 \times 4.1}{19.28}.$$

(b) ..... **[2]**

1sf

(b) Work out an estimate for

$$\frac{32.7 \times 4.1}{19.28}.$$

$$\frac{30 \times 4}{20} = \frac{120}{20} = 6$$

(b) 6 **[2]**

12 **(a)** Work out.
Give your answers in standard form.

(i) $3 \times 10^4 + 2.7 \times 10^2$

(a)(i) ..... **[2]**

(ii) $5 \times 10^6 \times 7 \times 10^8$

(ii) ..... **[2]**

(b) Estimate.

$$\sqrt{\frac{0.621 \times 7.94}{0.334}}$$

(b) ..... **[2]**

12 **(a)** Work out.
Give your answers in standard form.

(i) $3 \times 10^4 + 2.7 \times 10^2$

$30000 + 270$

$+ \quad 270$

30270

(a)(i) 3.027×10^4 ..... **[2]**

(ii) $5 \times 10^6 \times 7 \times 10^8$

35×10^{14}

(ii) 3.5×10^{15} ..... **[2]**

(b) Estimate.

$$\sqrt{\frac{0.621 \times 7.94}{0.334}}$$

$$\sqrt{\frac{0.6 \times 8}{0.3}} = \sqrt{\frac{4.8}{0.3}} = \sqrt{\frac{48}{3}} = \sqrt{16}$$

(b) 4 ✓ or -4 ..... **[2]**

9 **(a)** **(i)** By rounding each number correct to 1 significant figure, estimate the value of the following.
Show all your working.

$$\frac{12.3 + 7.92}{9.6 \times 0.625}$$

(a)(i) ..... **[2]**

(ii) Work out.

$$\frac{12.3 + 7.92}{9.6 \times 0.625}$$

Give your answer correct to 1 decimal place.

(ii) ..... **[2]**

9 **(a)** **(i)** By rounding each number correct to 1 significant figure, estimate the value of the following. Show all your working.

$$\frac{12.3 + 7.92}{9.6 \times 0.625}$$

$\frac{10 + 8}{10 \times 0.6} = \frac{18}{6} = 3$

(a)(i) 3 ..... **[2]**

(ii) Work out.

$$\frac{12.3 + 7.92}{9.6 \times 0.625}$$

Give your answer correct to 1 decimal place.

3.37

(ii) 3.4 ..... **[2]**

Video created by W Neill

(b) Ruth buys 19 identical tickets for £280.25.

Estimate the cost of one ticket.
Show your working.

(b) £ ..... **[2]**

Video created by W Neill

20

(b) Ruth buys 19 identical tickets for £280.25.

25f = £280

Estimate the cost of one ticket.
Show your working.

1Sf

$$\frac{280}{20}$$

(b) £ 14.00 ✓ **[2]**

(c) Estimate the value of

$$\frac{23.1 \times 3.9}{8.12}.$$

(c) ..... **[3]**

1Sf

(c) Estimate the value of

$$\frac{23.1 \times 3.9}{8.12}.$$

$$\frac{20 \times 4}{8} = \frac{80}{8}$$

(c) ..... 10 ..... [3]

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19 Asha worked out $\dfrac{326.8 \times (6.94 - 3.4)}{59.4}$.

N28

She got an answer of 19.5, correct to 3 significant figures.

Write each number correct to 1 significant figure to decide if Asha's answer is reasonable.

.....

..... **[3]**

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19 Asha worked out $\dfrac{326.8 \times (6.94 - 3.4)}{59.4}$.

N28 She got an answer of 19.5, correct to 3 significant figures.

Write each number correct to 1 significant figure to decide if Asha's answer is reasonable.

$$\frac{300 \times (7 - 3)}{60} = 20$$

20 is close to 19.5 so this is fine ✓

.....

..... **[3]**

(b) By writing each number correct to 1 significant figure, find an estimate for this calculation.

N28

$$\frac{22.1 \times 37}{1.9}$$

(b) ..... **[3]**

Video created by Will Neill

(b) By writing each number correct to 1 significant figure, find an estimate for this calculation.

N28

$$\frac{22.1 \times 37}{1.9}$$

$$\frac{20 \times 40}{2} = \frac{800}{2}$$

(b) 400 ✓ **[3]**

Asha worked out $\frac{326.8 \times (6.94 - 3.4)}{59.4}$.

She got an answer of 19.5, correct to 3 significant figures.

Write each number correct to 1 significant figure to decide if Asha's answer is reasonable.

.....

..... **[3]**

Created by W Neill

3 Asha worked out $\dfrac{326.8 \times (6.94 - 3.4)}{59.4}$.

N28 She got an answer of 19.5, correct to 3 significant figures.

Write each number correct to 1 significant figure to decide if Asha's answer is reasonable.

$$\frac{300 \times (7 - 3)}{60} = 20$$

20 is close to 19.5 so this is fine ✓

.....

..... [3]

2 By writing each number correct to 1 significant figure, find an estimate for this calculation.

N28

$$\frac{606.3 \times 0.312}{19.93}$$

..... **[3]**

Video created by Will Neill

2 By writing each number correct to 1 significant figure, find an estimate for this calculation.

N28

$$\frac{606.3 \times 0.312}{19.93}$$

$$\frac{600 \times 0.3}{20}$$

600×0.3

600×3

$= 1800$

$= 180$

$\frac{180}{20} = \frac{18}{2}$

9

..... **[3]**

Edexcel

12 Mel drives a bus 39 weeks in a year.

She drives the bus an average of 298 miles each week.

(a) Work out an estimate for the total number of miles Mel drives the bus in one year.

.....miles

(2)

(b) Is your answer to part (a) an underestimate or an overestimate?
You must give a reason for your answer.

.....

.....

(1)

12 Mel drives a bus 39 weeks in a year.

She drives the bus an average of 298 miles each week.

(a) Work out an estimate for the total number of miles Mel drives the bus in one year.

↳ 1sf

300 miles x 40 weeks

12000 miles

(2)

(b) Is your answer to part (a) an underestimate or an overestimate?
You must give a reason for your answer.

Overestimate, because I rounded both numbers up.

(1)

Video created by W Neill

28 Cars are made in a factory for 24 hours every day.

N28 In the factory a car is made every 209 seconds.

R26 (a) Work out an estimate for the number of cars made in the factory in one year.
You must show how you get your answer.

.....

(4)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

(1)

Video created by W Neill

28 Cars are made in a factory for 24 hours every day.

N28 In the factory a car is made every 209 seconds.

R26 (a) Work out an estimate for the number of cars made in the factory in one year.
You must show how you get your answer.

round

200

sec in a day

24 x 60 x 60

24 × 60 = 144

144 × 600 = 86400 sec in a day

Day = 86400 / 200

1sf

= 432 cars in a day x 365

≃ 400 cars x 400 days

160,000

160,000

(4)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

100,000 - 200,000 ✓

It could be either as I rounded 432 cars down and 365 days up ✓

(1)

16 Berenika wants to buy 35 T-shirts.

Each T-shirt costs £5.80
Berenika does the calculation $40 \times 6 = 240$ to estimate the cost of 35 T-shirts.

(a) Explain how Berenika's calculation shows the actual cost will be less than £240

.....

.....

(1)

16 Berenika wants to buy 35 T-shirts.

Each T-shirt costs £5.80
Berenika does the calculation $40 \times 6 = 240$ to estimate the cost of 35 T-shirts.

(a) Explain how Berenika's calculation shows the actual cost will be less than £240

40 X 6 = 240

actual 35 x 5·80 ... must be less than £240 as both numbers are lower than 40 and 6

(1)

20 Ami and Josh use a calculator to work out $\dfrac{595}{4.08^2 + 5.3}$

Ami's answer is 27.1115
Josh's answer is 271.115

One of these answers is correct.

Use approximations to find out which answer is correct.

(Total for Question 20 is 3 marks)

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20 Ami and Josh use a calculator to work out $\dfrac{595}{4.08^2 + 5.3}$

Ami's answer is 27.1115 ✓
Josh's answer is 271.115

One of these answers is correct.

Use approximations to find out which answer is correct.

↓
1sf

$4^2 = 16$

$\dfrac{600}{4^2 + 5} = \dfrac{600}{21}$

$16 + 5 = 21$

$= \dfrac{600}{20}$

$= 30$

27.1115 is closer to my approximation of 30 ✓

(Total for Question 20 is 3 marks)

Video created by W Neill

22 A cycle race across America is 3069.25 miles in length.

N28 Juan knows his average speed for his previous races is 15.12 miles per hour.
For the next race across America he will cycle for 8 hours per day.

(a) Estimate how many days Juan will take to complete the race.

.....

(3)

A cycle race across America is 3069.25 miles in length.

N28 Juan knows his average speed for his previous races is 15.12 miles per hour.
For the next race across America he will cycle for 8 hours per day.

(a) Estimate how many days Juan will take to complete the race.

3000 miles 15 miles

Juan in one day ⇒ 15 miles x 8 hrs

= 120 miles

$$\begin{array}{r} 025 \\ 12\overline{)\,3^{3}0^{6}0.00} \end{array}$$

25 days ✓

(3)

Juan trains for the race.
The average speed he can cycle at increases.
It is now 16.27 miles per hour.

(b) How does this affect your answer to part (a)?

.....

.....

(1)

Juan trains for the race.
The average speed he can cycle at increases.
It is now 16.27 miles per hour.

(b) How does this affect your answer to part (a)?

He should do the race in less time

(1)

Video Created by W Neill

24 A plane travels at a speed of 213 miles per hour.

(a) Work out an estimate for the number of seconds the plane takes to travel 1 mile.

N28
R20

..... seconds

(3)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

.....

.....

(1)

Video Created by W Neill

200

24 A plane travels at a speed of 213 miles per hour.

(a) Work out an estimate for the number of seconds the plane takes to travel 1 mile.

N28
R20

1sf

60x60
=3600

200 miles = 1 hrs
200 miles = 60 min
200 miles = 3600 seconds) ÷200
1 mile

3600 / 200 36/2 = 18

18 seconds

(3)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

actual 213 miles = 3600 sec) ÷213
1 sec

(1)

3600 sec / 200 = 18 sec

3600 / 213 ...ans is less than 18

18 must be an overestimate.

AQA

Video created by W Neill

13 (a) Use your calculator to work out the exact value of $\frac{18\,953 \times 437}{11}$

[1 mark]

N50

Answer _____

13 (b) Use approximations to 1 significant figure to check if your answer to part (a) is sensible.

[3 marks]

N28

Video created by W Neill

13 (a) Use your calculator to work out the exact value of $\frac{18\,953 \times 437}{11}$

[1 mark]

N50

Answer 752,951

13 (b) Use approximations to 1 significant figure to check if your answer to part (a) is sensible.

[3 marks]

N28

$$\frac{20{,}000 \times 400}{10} = \frac{8000000}{10}$$

Yes, its not far away so sensible. 800,000

Video created by W Neill

14 (a) Use your calculator to work out $9.95^2 \times 29.8$

Give your answer as a decimal.

N50

Write down your full calculator display.

[1 mark]

Answer _____

14 (b) Is your answer to part (a) sensible?

Use approximations to decide.

N28

You **must** show your working.

[3 marks]

Tick a box.

☐ Sensible ☐ Not sensible

Video created by W Neill

14 (a) Use your calculator to work out $9.95^2 \times 29.8$

Give your answer as a decimal.

N50

Write down your full calculator display.

[1 mark]

Answer 2950.2745

14 (b) Is your answer to part (a) sensible?

Use approximations to decide. 1SF

N28

You **must** show your working.

[3 marks]

$10^2 \times 30$

$100 \times 30 = 3000$

Tick a box.

☑ Sensible ☐ Not sensible

18 (b) Assume

the 240 cows produce milk for 10 months each year

each cow produces an average of 25 litres of milk per **day**.

N28

Estimate the total milk production, in litres, of the 240 cows in one year.

You **must** show your working.

[4 marks]

Answer _____ litres

Video created by W Neill

18 (b) Assume

N28

the 240 cows produce milk for 10 months each year

each cow produces an average of 25 litres of milk per **day**.

Estimate the total milk production, in litres, of the 240 cows in one year.

You **must** show your working.

[4 marks]

Per day

240 x 25 litres

6000 Litres per day

Per month (30 days)

6000 x 30

180000 Litres

10 months

x 10

Answer 1800000 litres

Video created by W Neill

12 Use approximations to 1 significant figure to estimate the value of

N28 $$\frac{0.526 \times 39.6^2}{\sqrt{97.65}}$$

You **must** show your working.

[3 marks]

Answer _____

Video created by W Neill

12 Use approximations to 1 significant figure to estimate the value of

N28 $$\frac{0.526 \times 39.6^2}{\sqrt{97.65}}$$

You **must** show your working.

$$\frac{0.5 \times 40^2}{\sqrt{100}}$$

40^2

40×40

[3 marks]

$= 1600$

0.5×1600

$= 800$

$\sqrt{100} = 10$

$$\frac{800}{10}$$

Answer 80 ✓

Video created by W Neill

4 Circle the number that is closest in value to $\frac{9.8}{0.0195}$

[1 mark]

N28

N31

5 50 500 5000

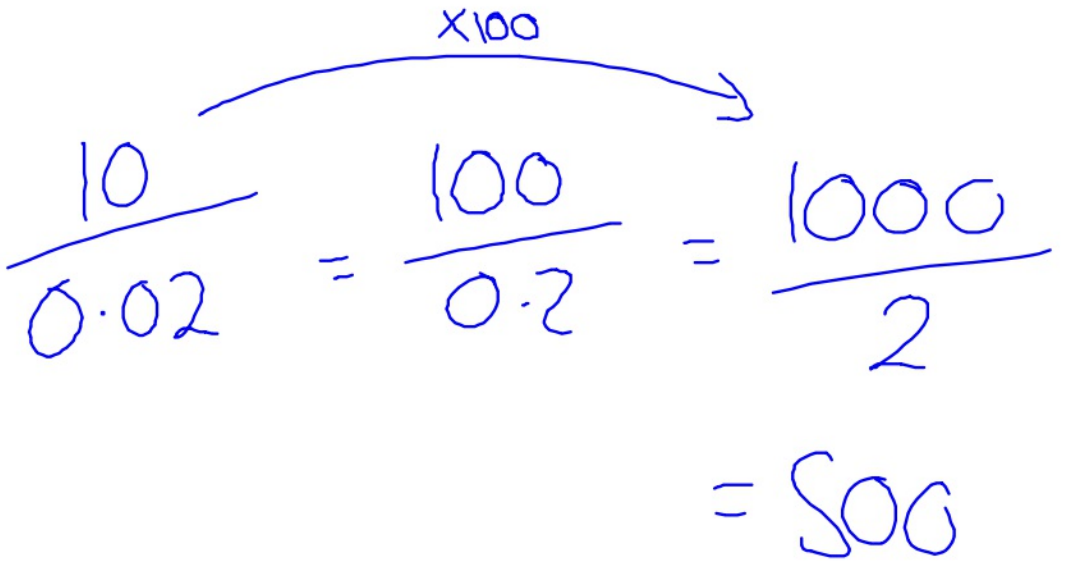
Video created by W Neill

4 Circle the number that is closest in value to $\frac{9.8}{0.0195}$

[1 mark]

N28
N31

5 50 500 5000



16 Circle the number that is closest to the value of 29^3

[1 mark]

N28

27 000 90 2700 9000

16 Circle the number that is closest to the value of 29^3

[1 mark]

N28

27 000 90 2700 9000

30^3 ... $30 \times 30 \times 30$

27000

Video created by W Neill

13 Work out $4 + 3 \times 5 - 1$

Circle your answer.

[1 mark]

N29

16 18 28 34

$4 + 3 \times 5 - 1$

$4 + 15 - 1$