

Self Assessment Diagnostic Test

Do NOT use a calculator

Each question has ONE correct answer – circle the letter, (a), (b) or (c), for the answer that you think is correct.

Circle (d) if you have never been taught the maths topic involved in the question.

Q1 The temperature at ten o'clock at night was found to be -5 degrees Celsius. The temperature then decreased by 2 degrees over the next two hours. Which of the following is correct?

- a) Temperature at midnight = $-5 + 2$
 - b) Temperature at midnight = $-(5 - 2)$
 - c) Temperature at midnight = $-5 - 2$
 - d) I have never studied this topic in maths
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Q2 Which of the following expressions is correct?

- a) $-8.9 < -9.1$
 - b) $-9.1 > -8.9$
 - c) $-2.5 > -13.6$
 - d) I have never studied this topic in maths
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Q3 The tidal range is the vertical difference in water level between high tide and low tide. The tidal range on a particular day in Chichester harbour is 4.6m. At low tide a sandbank is 1.2m below the water surface. What will be the situation at high tide?

- a) The sandbank will be 3.4m below the surface
 - b) The sandbank will be 5.8m below the surface
 - c) The sandbank will be 3.4m above the surface
 - d) I have never studied this topic in maths
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Q4 $(4 - 6) \times (-3)$ is equal to

- a) 30
 - b) 6
 - c) -6
 - d) I have never studied this topic in maths
-

Q5 $2 + 3 \times 5$ is equal to

- a) 25
 - b) 17
 - c) 30
 - d) I have never studied this topic in maths
-

Q6 $5 - \frac{6}{(3-5)}$ is equal to

- a) 8
 - b) $\frac{1}{2}$
 - c) 2
 - d) I have never studied this topic in maths
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Q7 The scale on a map is 10 cm equivalent to 5 miles.
What is the distance equivalent to 7 cm on the map?

- a) $\frac{50}{7}$ miles
 - b) 3.5 miles
 - c) $\frac{70}{5}$ miles
 - d) I have never studied this topic in maths
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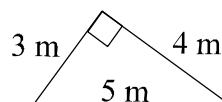
Q8 5 miles is approximately equal to 8 kilometres.
What is the approximate distance in miles equivalent to 21 kilometres

- a) $\frac{21}{8} \times 5$ miles
 - b) $\frac{8}{5} \times 21$ miles
 - c) $\frac{8}{21} \times 5$ miles
 - d) I have never studied this topic in maths
-

Q9 A volume of 8.0 m^3 is equal to:
($1.00 \text{ m} = 100 \text{ cm}$)

- a) 800 cm^3
 - b) 80000 cm^3
 - c) 8000000 cm^3
 - d) I have never studied this topic in maths
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Q10 A right-angled triangle has sides of length 3.0 m, 4.0 m and 5.0 m as shown in the diagram:



Calculate the area of the triangle (to 1 decimal place).
(The area of a triangle is equal to half base times height)

- a) 6.0 m^2
 - b) 6.2 m^2
 - c) 6.5 m^2
 - d) I have never studied this topic in maths
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Q11 $\frac{1}{\left(\frac{1}{4}\right)}$ is equal to

- a) 0.25
 - b) $-\frac{1}{4}$
 - c) 4
 - d) I have never studied this topic in maths
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Q12 $\frac{2}{3} \times \frac{3}{4}$ is equal to

- a) $\frac{1}{2}$
 - b) $\frac{5}{7}$
 - c) $\frac{5}{12}$
 - d) I have never studied this topic in maths
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Q13 $\frac{1}{4} + \frac{1}{3}$ is equal to

- a) $\frac{2}{7}$
 - b) $\frac{7}{12}$
 - c) $\frac{12}{7}$
 - d) I have never studied this topic in maths
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Q14 A particular butterfly spent one quarter of its life (after the egg stage) as a caterpillar, and then two thirds of its life as a pupa before the final stage of being an adult butterfly. What fraction of its life did it spend as an adult butterfly?

- a) $\frac{1}{12}$
 - b) $\frac{11}{12}$
 - c) $\frac{4}{7}$
 - d) I have never studied this topic in maths
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Q15 Convert the fraction $\frac{4}{80}$ to a percentage:

- a) 5.5 %
 - b) 4.5 %
 - c) 5.0 %
 - d) I have never studied this topic in maths
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Q16 10^3 is equal to

- a) 30
 - b) 1000
 - c) 3000
 - d) I have never studied this topic in maths
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Q17 10^{-2} is equal to

- a) 0.001
 - b) -100
 - c) $\frac{1}{100}$
 - d) I have never studied this topic in maths
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Q18 $(10^3)^2$ is equal to

- a) 10^6
 - b) 10^5
 - c) $10^{2/3}$
 - d) I have never studied this topic in maths
-

Q19 $4^3 \times 4^3$ is equal to

- a) 4^6
 - b) 4^9
 - c) 8^3
 - d) I have never studied this topic in maths
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Q20 4^{-2} is equal to

- a) 2
 - b) $\frac{1}{2}$
 - c) $\frac{1}{16}$
 - d) I have never studied this topic in maths
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- Q21** Calculate the reciprocal of 5
- a) 0.5
 - b) 0.2
 - c) -5
 - d) I have never studied this topic in maths
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- Q22** $9^{1/2}$ is equal to
- a) 3
 - b) $\frac{1}{81}$
 - c) 4.5
 - d) I have never studied this topic in maths
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- Q23** Give the number 251.59251 rounded to 3 decimal places
- a) 251.593
 - b) 252
 - c) 251.592
 - d) I have never studied this topic in maths
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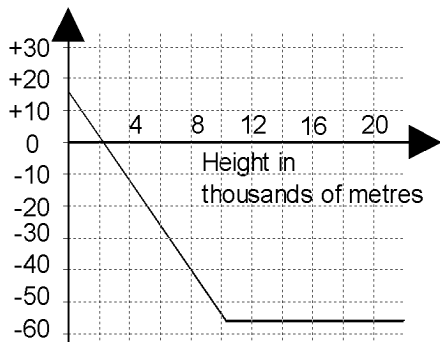
- Q24** Students were asked to write the number 21.0446 correct to three significant figures. Which was the correct answer?
- a) 21.045
 - b) 21.0
 - c) 21.1
 - d) I have never studied this topic in maths
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- Q25** Four chemical solutions are found to have different concentrations (in grams per litre) as listed below. Which solution has the highest concentration?
- a) 3.6×10^{-4}
 - b) 9.7×10^{-4}
 - c) 1.2×10^{-3}
 - d) I have never studied this topic in maths
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- Q26** Multiply 3.0×10^6 by 4.0×10^3
- a) 12.0×10^{18}
 - b) 1.2×10^{10}
 - c) 1.2×10^{18}
 - d) I have never studied this topic in maths
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- Q27** Add 3.12×10^6 to 2.6×10^5
- a) 5.72×10^{11}
 - b) 2.912×10^5
 - c) 3.38×10^6
 - d) I have never studied this topic in maths
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Q28 Air Temperature
in degrees Celsius

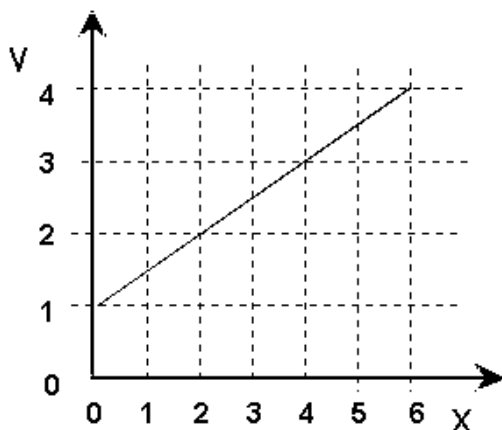


The graph shows the approximate air temperature as a function of height above ground level.

Which of the following statements is correct?

- a) Climbing from 4000m to 8000m the air gets warmer.
- b) Climbing from 12000m to 20000m the air gets colder.
- c) The rate of change of temperature is the same at 800m as it is at 8000m.
- d) I have never studied this topic in maths

Q29



The line in the graph can be represented by the equation $y = mx + c$

What is the slope ('m' in the equation) of this line?

- a) $\frac{2}{3}$
- b) 1.5
- c) 0.5
- d) I have never studied this topic in maths

Q30 Which one of the following points (x,y) lies on the straight line: $y = 3x - 2$

- a) (2, 2)
- b) (2, 4)
- c) (4, 2)
- d) I have never studied this topic in maths

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- Q31** The minimum temperatures (in degrees Celsius) at night for five days were, +3, -1, 0, -1, +4
What was the average (mean) value for the night temperature minima for that period?
- a) 0
 - b) 1.25
 - c) 1.0
 - d) I have never studied this topic in maths
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- Q32** If $y = 35 + 7x$, what is the value of x when $y = 14$?
- a) 21
 - b) -3
 - c) 3
 - d) I have never studied this topic in maths
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- Q33** The height, h , of a plant after a time, t , during an initial growth period is given by

$$h = \sqrt{4 + 4t + t^2}$$

What will be the height of the plant after a time, $t = 3$?

- a) 25
 - b) 5
 - c) $\sqrt{17}$
 - d) I have never studied this topic in maths
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- Q34** If $y = mx + c$, which of the following is true?

a) $x = \frac{y}{m} - c$

b) $x = \frac{(y - c)}{m}$

c) $x = \frac{(y - m)}{c}$

- d) I have never studied this topic in maths
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- Q35** If $\frac{3x - 6}{2} = 9$, which of the following is true?

a) $x = 12$

b) $x = 8$

c) $x = 6$

- d) I have never studied this topic in maths
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- Q36** Multiply out the brackets in the following expression:

$$(3x + 2)(x - 5)$$

a) $3x^2 - 7x - 10$

b) $3x^2 - 13x - 7$

c) $3x^2 - 13x - 10$

- d) I have never studied this topic in maths
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Q37 Simplify the expression: $\frac{2x + 6}{6x}$

a) $\frac{x + 3}{3x}$

b) $\frac{4}{3}$

c) $\frac{x + 2}{x}$

d) I have never studied this topic in maths

Q38 In a simple mathematical game, I think of a number, double it, add ten, then multiply by three and then take away the number I first thought of. If the number I first thought of is described by 'n', which of the following expressions describes the process above?

a) $3(2n + 10) - n$

b) $2n + 10 \times 3 - n$

c) $n \times 2 + 10 \times 3 - n$

d) I have never studied this topic in maths

Q39 $\log_{10}(10^2)$ is equal to:

a) 20

b) 0.2

c) 2

d) I have never studied this topic in maths

Q40 $\log_{10}(A) - \log_{10}(B)$ is equal to:

a) $\log_{10}(A/B)$

b) $\log_{10}(A-B)$

c) $\log_{10}(B-A)$

d) I have never studied this topic in maths
