Multiple-choice section – choose the correct answer

Question 1 [3.1]

The expression *a* × *a*4 *s*implifies to:

A *a*5 B *a*4 C *a*3 D 

Question 2 [3.6]

Expanded, (*n* + 3)2 is equivalent to:

A *n*2 + 6*n* + 9 B *n*2 – 9 C *n*2 – 6*n* + 9 D *n*2 + 9

Question 3 [3.5]

Expanded, 4(*p* – 1) is equal to:

A 4*p* – 1 B 5*p* C 4*p* – 4 D *p* – 1

Question 4 [3.7]

Fully factorising 6*d*2 – 12*d*2*c* gives:

A 6(*d*2 – *d*2*c*) B 6*d*2(1 – 2*c*) C 6*d*(*d* – *dc*) D 6*d*2(*d* – 2*c*)

Question 5 [3.3]

How many significant figures does the number 42 040 have?

A 5 B 4 C 3 D 2

Question 6 [3.8]

When using grouping in pairs to factorise the expression *cd* + 2*c* + 5*d* + 10, the pairs that share common factors could be:

A *cd* and 10, and 2*c* and 5*d*

B *cd* and 5*d*, and 2*c* and 10

C *cd*, 2*c* and 5*d*, and 10

D *cd*, 2*c* and 10, and 5*d*

Question 7 [3.1]

Simplified, 16*a*10 ÷ 4*a*2 equals:

A 4*a*5 B 4*a*12 C 4*a*8 D 12*a*8

Question 8 [3.2]

The expression 35 × 45 simplifies to:

A 125 B 1225 C 75 D ****

Question 9 [3.4]

Rearranging the formula  to make *m* the subject of the equation gives:

A *m* = *pq* B  C  D *q* = *pm*

Question 10 [3.2]

4-3 is equivalent to:

A -12 B  C 12-1 D 

Multiple-choice results: \_\_\_ / 10

Short answer section

Question 11 3 marks [3.2]

Use words from the list below to complete the following sentences.

positive negative magnitude multiplied divided power

Any number written with a negative power can be written as 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by the number raised to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ power of the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Question 12 2 marks [3.5, 3.7]

Explain the difference between the instructions ‘factorise’ and ‘expand’. Use the expression   
6*ab* + 8*a* to help you explain.

Question 13 2 marks [3.1]

Simplify each of the following.

(a) 4*c*5 × 3*c*2

(b) 16*g*7 ÷ 4*g*

Question 14 4 marks [3.1]

Simplify each of the following.

(a) 

(b) (*m* 4)2 × (*m* 7)3

Question 15 4 marks [3.2]

Simplify each of the following.

(a) (3*p*3)2

(b) 

Question 16 2 marks [3.2]

Simplify each of the following, leaving your answers in index form with positive powers.

(a) *p*-3

(b) *c*4 ÷ *c*9

Question 17 3 marks [3.2]

Simplify each of the following.

(a) 50

(b) 5*w*0

(c) (5*w*)0

Question 18 4 marks [3.3]

(a) Write the number 43 700 in scientific notation.

(b) Write 4.37 × 104 as a number.

(c) Write the number 0.0402 in scientific notation.

(d) Write 4.2 × 10-2 as a number.

Question 19 2 marks [3.3]

Evaluate 3.27 × 10-4 ÷ 6.52 × 10-7. Express your answer in scientific notation.

Question 20 1 mark [3.3]

**(a)** How many significant figures does the number 40.30 have?

**(b)** How many significant figures does the number 0.000 51 have?

Question 21 3 marks [3.4]

Rearrange the formulas below to make the variables in brackets the subject.

(a)  (*V*)

(b) *ab* – *c* = *d* (*b*)

Question 22 3 marks [3.5]

Expand and simplify the following expressions.

(a) 3(*p* – 2*a*)

(b) 3(*m* – 3) + 5(*m* + 2*p*)

Question 23 4 marks [3.5]

Expand and simplify the following expressions.

(a) (*a* + 4)(*a* + 5)

(b) (*d* – 4)(*d* + 3)

Question 24 4 marks [3.6]

Expand and simplify each of the following.

(a) (*x* + 5)2

(b) (*y* – 7)2

Question 25 2 marks [3.6]

Expand and simplify each of the following.

(a) (*a* – *b*)(*a* + *b*)

(b) (*z* – 3)(*z* + 3)

Question 26 3 marks [3.7]

Fully factorise each of the following.

(a) 24*n* – 12

(b) 3*mpq* – 7*mq*

Question 27 2 marks [3.7]

Fully factorise each of the following.

(a) *x*(*y* – 5) + 2(*y* – 5)

(b) 3*y*(2*m* + 1) – 5(2*m* + 1)

Question 28 2 marks [3.8]

Use the grouping in pairs technique to fully factorise the expression *xy* + 5*x* + 2*y* + 10.

Short answer results: \_\_\_ / 50

Extended answer section

Question 29 5 marks [3.3]

Consider our solar system.

(a) Saturn is 1 424 600 000 km from the Sun. Write this in scientific notation.

(b) Jupiter is 778 330 000 km from the Sun. How many significant figures does this distance contain?

(c) Mercury is 5.791 × 107 km from the Sun. Venus is 1.082 × 108 km from the Sun. How much closer to the Sun is Mercury? Express your answer in scientific notation.

(d) Uranus is 2 873 550 000 km from the Sun. Round this to 4 significant figures, expressing your answer in scientific notation.

Extended answer results: \_\_\_ / 5

TOTAL test results: \_\_\_ / 65