Extended Mathematics
Topic : Algebra -1
Year :May 2013 -May 2024
Paper - 2
Questions Booklet

Question 1

$$y = \sqrt{8 + \frac{4}{x}}$$

Find y when $x = 2$.
Give your answer correct to 4 decimal places.

Answer y = ... [4]

Question 2

Factorise completely $ab + bc + ad + cd$.

Answer .... [2]

Question 3

Find the value of $2x + y$ for the simultaneous equations.

$$3x + 5y = 48$$
$$2x - y = 19$$

Answer $2x + y$ = ... [4]

Question 4

Use the quadratic equation formula to solve

$$2x^2 + 7x - 3 = 0 .$$

Show all your working and give your answers correct to 2 decimal places.

Answer x = ... or x = ... [4]

Question 5

Solve the equation.

$$5(2y - 17) = 60$$

Answer y = ... [3]

Question 6

Factorise completely.

$$kp + 3k + mp + 3m$$

Answer ..... [2]

Question 7

(a) Factorise $x^2 + x - 30$.

Answer(a) ..... [2]

(b) Simplify $\dfrac{(x-5)(x+4)}{x^2+x-30}$.

Answer(b) ..... [1]

Question 8

Factorise completely.

$ap + bp - 2a - 2b$

Answer ..... [2]

Question 9

Factorise completely.

$12xy - 3x^2$

Answer ..... [2]

Question 10

(a) Expand and simplify $(a+b)^2$.

Answer(a) ..... [2]

(b) Find the value of $a^2 + b^2$ when $a + b = 6$ and $ab = 7$.

Answer(b) ..... [1]

Question 11

The solutions of the equation $x^2 - 6x + d = 0$ are both integers.
d is a prime number.

Find d.

Answer $d =$ ..... [3]

Question 12

Solve the equation $1 + 2x = -15$.

Answer $x =$ ..... [2]

Question 13

Find the co-ordinates of the point of intersection of the two lines.

$2x - 7y = 2$
$4x + 5y = 42$

Answer (..... , ...) [3]

Question 14

Factorise completely.

(a) $a + b + at + bt$

Answer(a) ..... [2]

(b) $x^2 - 2x - 24$

Answer(b) ..... [2]

Question15

Solve the equation.

$$5 - 2x = 3x - 19$$

Answer $x =$ ..... [2]

Question 16

(a) Factorise $3x^2 + 2x - 8$.

Answer(a) ..... [2]

(b) Solve the equation $3x^2 + 2x - 8 = 0$.

Answer(b) $x =$ ..... or $x =$ ..... [1]

Question 17

Factorise completely.

$$15a^3 - 5ab$$

Answer ..... [2]

Question 18

Simplify.

$$\frac{x^2 + 6x - 7}{3x + 21}$$

Answer ..... [4]

Question 19

Factorise completely.

(a) $4p^2q - 6pq^2$

Answer(a) ..... [2]

(b) $u + 4t + ux + 4tx$

Answer(b) ..... [2]

Question 20

Solve the equation.

$$\frac{3}{2x} + \frac{1}{x+1} = 0$$

Answer $x =$ ..... [3]

Question 21

Solve the simultaneous equations.

$$2x - y = 7$$
$$3x + y = 3$$

Answer $x =$ .....

$y =$ ..... [2]

Question 22

Factorise completely.

(a) $ax + ay + bx + by$

Answer(a) ..... [2]

(b) $3(x-1)^2 + (x-1)$

Answer(b) ..... [2]

Question 23

Solve the equation.

$$\frac{n-8}{2} = 11$$

Answer $n =$ ..... [2]

Question 24

$$y = \frac{2}{x^2} + \frac{x^2}{2}$$

Find the value of y when $x = 6$.
Give your answer as a mixed number in its simplest form.

Answer $y =$ ..... [2]

Question 25

Solve the equation.

$$\frac{2x+5}{3} = 8$$

Answer $x =$ ..... [3]

Question 26

Simplify.

$$\frac{4x^2 - 16x}{2x^2 + 6x - 56}$$

Answer(b) ..... [4]

Question 27

Solve the simultaneous equations.
You must show all your working.

$$\tfrac{1}{2}x - 8y = 1$$
$$x + 2y = 6\tfrac{1}{2}$$

Answer $x =$ .....

$y =$ ..... [3]

Question 28

Factorise $14p^2 + 21pq$.

Answer ..... [2]

Question 29

Solve the equation.

$$2x^2 + x - 2 = 0$$

Show your working and give your answers correct to 2 decimal places.

Answer $x =$ ..... or $x =$ ..... [4]

Question 30

Solve the equation.

$$3(x + 4) = 2(4x - 1)$$

Answer $x =$ ..... [3]

Question 31

Factorise $2x^2 - 5x - 3$.

Answer ..... [2]

Question 32

Factorise completely.

$$9x^2 - 6x$$

Answer ..... [2]

Question 33

$f(x) = x^2 + 4x - 6$

(a) $f(x)$ can be written in the form $(x + m)^2 + n$.

Find the value of m and the value of n.

Answer(a) m = ...

n = ... [2]

(b) Use your answer to **part (a)** to find the positive solution to $x^2 + 4x - 6 = 0$.

Answer(b) x = ... [2]

Question 34

Factorise completely.

(a) $yp + yt + 2xp + 2xt$

Answer(a) ..... [2]

(b) $7(h + k)^2 - 21(h + k)$

Answer(b) ..... [2]

Question 35

Solve the simultaneous equations.
You must show all your working.

$5x + 2y = -2$
$3x - 5y = 17.4$

Answer x = ...

y = ... [4]

Question 36

Simplify.

$6uw^{-3} \times 4uw^6$

Answer ..... [2]

Question 37

Expand and simplify.

$x(2x + 3) + 5(x - 7)$

Answer ..... [2]

Question 38

Simplify.

$$\frac{4+10w}{8-50w^2}$$

Answer ..... [4]

Question 39

Solve the equation $3x^2 + 4x - 5 = 0$.
Show all your working and give your answers correct to 2 decimal places.

Answer $x =$ ..... or $x =$ ..... [4]

Question 40

Simplify.

$$1 - 2u + u + 4$$

Answer ..... [2]

Question 41

Factorise completely.

$$2x - 4x^2$$

Answer ..... [2]

Question 42

Solve the equation $5x^2 - 6x - 3 = 0$.
Show all your working and give your answers correct to 2 decimal places.

Answer $x =$ ..... or $x =$ ..... [4]

Question 43

Factorise

(a) $9w^2 - 100$,

Answer(a) ..... [1]

(b) $mp + np - 6mq - 6nq$.

Answer(b) ..... [2]

Question 44

Simplify. $\dfrac{x^2 - 16}{x^2 - 3x - 4}$

Answer ..... [4]

Question 45

Factorise completely.

(a) $ax + ay + 3cx + 3cy$

Answer(a) ..... [2]

(b) $3a^2 - 12b^2$

Answer(b) ..... [3]

Question 46

Solve the equation $3x^2 - 11x + 4 = 0$.
Show all your working and give your answers correct to 2 decimal places.

$x =$ ..... or $x =$ .....[4]

Question 47

Factorise $2x - 4xy$.

..... [2]

Question 48

Solve $(x - 7)(x + 4) = 0$.

$x =$ ..... or $x =$ .....[1]

Question 49

Solve the equation.

$$6(y + 1) = 9$$

$y =$ ..... [2]

Question 50

Solve the simultaneous equations.
Show all your working.

$$3x + 4y = 14$$
$$5x + 2y = 21$$

$x =$ .....

$y =$ ..... [3]

Question 51

$y = x^2 + 7x - 5$ can be written in the form $y = (x + a)^2 + b$.

Find the value of a and the value of b.

$a =$ .....

$b =$ ..... [3]

Question 52

Factorise completely.

(a) $2a+4+ap+2p$

..... [2]

(b) $162-8t^2$

..... [2]

Question 53

$y=mx+c$

Find the value of y when $m=-2$, $x=-7$ and $c=-3$.

$y=$ ..... [2]

Question 54

Simplify. $\dfrac{42np-7n}{12pt-2t+18mp-3m}$

..... [4]

Question 55

$V=4p^2$

Find V when $p=3$.

$V=$ ..... [1]

Question 56

Factorise.

(a) m^3+m

..... [1]

(b) $25-y^2$

..... [1]

(c) $x^2+3x-28$

..... [2]

Question 57

Solve the simultaneous equations.
You must show all your working.

$$\frac{1}{2}x + y = 8$$
$$x - 2y = 2$$

$x =$ .....

$y =$ ..... [3]

Question 58

Solve the equation.

$$6(k - 8) = 78$$

$k =$ ..... [2]

Question 59

Solve the equation $2x^2 + 3x - 3 = 0$.
Show all your working and give your answers correct to 2 decimal places.

$x =$ ..... or $x =$ ..... [4]

Question 60

Factorise completely.

(a) $4p^2 - 9$

..... [1]

(b) $2ax - 4bx - ay + 2by$

..... [2]

Question 61

Solve the simultaneous equations.
You must show all your working.

$$2x + 3y = 13$$
$$x + 2y = 9$$

$x =$ .....

$y =$ ..... [3]

Question 62

Simplify. $\dfrac{x^3y + 2xy^3}{x^2y^2}$

..... [2]

Question 63

Factorise completely.

(a) $15c^2 - 5c$

..... [2]

(b) $2kp - km + 6p - 3m$

..... [2]

Question 64

$$s = ut + 16t^2$$

Find the value of s when $u = 2$ and $t = 3$.

$s =$ ..... [2]

Question 65

Expand the brackets and simplify.

$$4(5w + 3) - 2(w - 1)$$

..... [2]

Question 66

(a) Simplify.

$$\frac{4(x-6)^2}{(x-6)}$$

..... [1]

(b) Expand the brackets and simplify.

$$(x + 4)^2 + 5(3x + 2)$$

..... [3]

Question 67

Solve the equation $5x^2 + 10x + 2 = 0$.
You must show all your working and give your answers correct to 2 decimal places.

$x =$ ..... or $x =$ ..... [4]

Question 68

Factorise completely.

$$4x^2 - 8xy$$

..... [2]

Question 69

Factorise completely.

(a) $9t^2 - u^2$

..... [2]

(b) $2c - 4d - pc + 2pd$

..... [2]

Question 70

Solve.

$$2-x=5x+1$$

$x =$ ..... [2]

Question 71

Find the value of $5a-3b$ when $a=7$ and $b=-2$.

..... [2]

Question 72

Factorise.

$$14x-21y$$

..... [1]

Question 73

Factorise completely.

$$12n^2-4mn$$

..... [2]

Question 74

Factorise completely.

(a) $x^2-x-132$

..... [2]

(b) x^3-4x

..... [2]

Question 75

Solve the equations.

(a) $7-3n=11n+2$

$n =$ ..... [2]

(b) $\frac{p-3}{5}=3$

$p =$ ..... [2]

Question 76

Solve the simultaneous equations.
You must show all your working.

$$y = \frac{x}{2}$$
$$2x - y = 1$$

$x =$ .....

$y =$ ..... [3]

Question 77

Expand the brackets and simplify.

$$(5-n)(3+n)$$

..... [2]

Question 78

Factorise completely.

$$12x^2 + 15xy - 9x$$

..... [2]

Question 79

Solve the equation $2x^2 + 7x - 3 = 0$.
Show all your working and give your answers correct to 2 decimal places.

$x =$ ..... or $x =$ ..... [4]

Question 80

Solve the simultaneous equations.
You must show all your working.

$$2x + \frac{1}{2}y = 13$$
$$3x + 2y = 17$$

$x =$ .....

$y =$ ..... [3]

Question 81

Factorise completely.

$$15k^2m - 20m^4$$

..... [2]

Question 82

Expand the brackets and simplify.

$$(2p+3)(3p-2)$$

..... [3]

Question 83

Simplify.

$$\frac{3+x}{9-x^2}$$

..... [2]

Question 84

Factorise completely.

$$2a+4b-ax-2bx$$

..... [2]

Question 85

Solve.

$$\frac{1-p}{3}=4$$

$p =$ ..... [2]

Question 86

Factorise.

$$w+w^3$$

..... [1]

Question 87

Factorise completely.

$$xy + 2y + 3x + 6$$

..... [2]

Question 88

Complete these statements.

(a) When $w =$ ..... , $10w = 70$. [1]

(b) When $5x = 15$, $12x =$ ..... [1]

Question 89

Expand.

$$7(x - 8)$$

..... [1]

Question 90

Expand and simplify.

$$6(2y - 3) - 5(y + 1)$$

..... [2]

Question 91

Find the value of $7x + 3y$ when $x = 12$ and $y = -6$.

..... [2]

Question 92

Factorise completely.

(a) $px + py - x - y$

..... [2]

(b) $2t^2 - 98m^2$

..... [3]

Question 93

Simplify.

$$\frac{2x^2 - x - 1}{2x^2 + x}$$

..... [4]

Question 94

Solve the equation $3x^2 - 2x - 2 = 0$.
Show all your working and give your answers correct to 2 decimal places.

$x =$ ..... or $x =$ ..... [4]

Question 95

Solve.

$$3w - 7 = 32$$

$w =$ ..... [2]

Question 96

Simplify.

$$2p - q - 3q - 5p$$

..... [2]

Question 97

Factorise.

$$y - 2y^2$$

..... [1]

Question 98

$x^2 - 12x + a = (x + b)^2$

Find the value of a and the value of b.

$a =$ .....

$b =$ ..... [3]

Question 99

Factorise.

$xy + 5y + 2x + 10$

..... [2]

Question 100

Expand.

$2x(3 - x^2)$

..... [2]

Question 101

Use the quadratic formula to solve the equation $3x^2 + 7x - 11 = 0$.
You must show all your working and give your answers correct to 2 decimal places.

$x =$ ..... or $x =$ ..... [4]

Question 102

Solve the simultaneous equations.
You must show all your working.

$2x + 3y = -12$

$5x + 2y = 14$

$x =$ .....

$y =$ ..... [4]

Question 103

Expand and simplify.

$(3x - 7)(2x + 9)$

..... [2]

Question 104

Simplify.

$\frac{ab - b^2}{a^2 - b^2}$

..... [3]

Question 105

Factorise.

(a) $7k^2 - 15k$

..... [1]

(b) $12(m+p)+8(m+p)^2$

..... [2]

Question 106

Simplify $\frac{x^3+5x^2}{x^2-25}$, giving your answer as a single fraction.

..... [3]

Question 107

One solution of the equation $ax^2+a=150$ is $x=7$.

(a) Find the value of a.

$a =$ ..... [2]

(b) Find the other solution.

$x =$ ..... [1]

Question 108

Rearrange $2(w+h)=P$ to make w the subject.

$w =$ ..... [2]

Question 109

Factorise $2x^2-x$.

..... [1]

Question 110

Solve the equation $3x^2-2x-10=0$.
Show all your working and give your answers correct to 2 decimal places.

$x =$ ..... or $x =$ ..... [4]

Question 111

Solve the simultaneous equations.
You must show all your working.

$$5x+8y=4$$
$$\tfrac{1}{2}x+3y=7$$

$x =$ .....

$y =$ ..... [3]

Question 112

Solve the equation.

$$9f+11=3f+23$$

$f=$ ..... [2]

Question 113

(a) Factorise p^2-q^2.

..... [1]

(b) $p^2-q^2=7$ and $p-q=2$.

Find the value of $p+q$.

..... [2]

Question 114

Expand and simplify.

$$(x+1)(x+2)+2x(x-3)$$

..... [3]

Question 115

$$x^2+4x-9=(x+a)^2+b$$

Find the value of a and the value of b.

$a=$ .....

$b=$ ..... [3]

Question 116

Factorise $5y-6py$.

..... [1]

Question 117

Factorise.

(a) $12x+15$

..... [1]

(b) $xy-2x+3y-6$

..... [2]

Question 118

Expand and simplify $(x+3)(x+5)$.

..... [2]

Question 119

(a) Factorise.

$$18y - 3ay + 12x - 2ax$$

..... [2]

(b) Factorise.

$$3x^2 - 48y^2$$

..... [3]

Question 120

Expand.

$$a(a^3 + 3)$$

..... [1]

Question 121

Solve.

$$\frac{x-2}{3} = 3$$

$x =$ ..... [2]

Question 122

Simplify $5c - d - 3d - 2c$.

..... [2]

Question 123

Factorise $5p + pt$.

..... [1]

Question 124

$$x^2 - 12x + a = (x + b)^2$$

Find the value of a and the value of b.

$a =$ .....

$b =$ ..... [2]

Question 125

Solve the simultaneous equations.
You must show all your working.

$$x = 7 - 3y$$
$$x^2 - y^2 = 39$$

$x =$ ..... $y =$ .....

$x =$ ..... $y =$ ..... [6]

Question 126

(a) Factorise completely.

$3x^2 - 12xy$

..... [2]

(b) Expand and simplify.

$(m-3)(m+2)$

..... [2]

Question 127

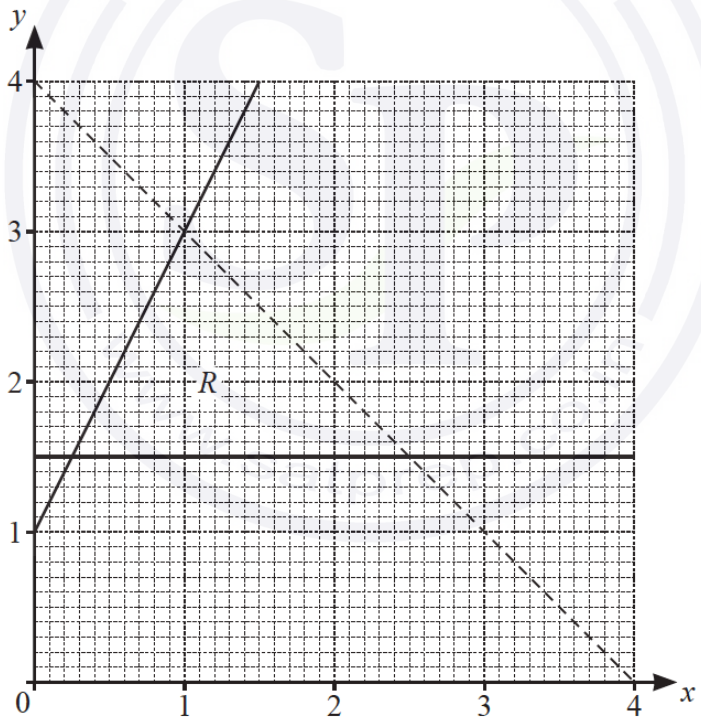
(a) Write $x^2 - 18x - 27$ in the form $(x+k)^2 + h$.

..... [2]

(b) Use your answer to **part (a)** to solve the equation $x^2 - 18x - 27 = 0$.

$x =$ ..... or $x =$ ..... [2]

Question 128



Write down the three inequalities that define the region R.

.....

.....

..... [4]

Question 129

Simplify.

$$\frac{2x^2+x-15}{ax+3a-2bx-6b}$$

..... [5]

Question 130

Solve the equation.

$$\frac{1-x}{3}=5$$

$x =$ ..... [2]

Question 131

Simplify.

$$\frac{p}{2q}\times\frac{4pq}{t}$$

..... [2]

Question 132

$$y=mx+c$$

Find the value of y when $m=-3$, $x=-2$ and $c=-8$.

$y =$ ..... [2]

Question 133

Expand and simplify $(x+3)(x-5)(3x-1)$.

..... [3]

Question 134

The curve $y=x^2-2x+1$ is drawn on a grid.
A line is drawn on the same grid.
The points of intersection of the line and the curve are used to solve the equation $x^2-7x+5=0$.

Find the equation of the line in the form $y=mx+c$.

$y =$ ..... [1]

Question 135

Factorise completely.

(a) $21a^2+28ab$

..... [2]

(b) $20x^2-45y^2$

..... [3]

Question 136

Simplify.

$$\frac{x^2-25}{x^2-17x+60}$$

..... [4]

Question 137

Factorise.

$$3x+8y-6ax-16ay$$

..... [2]

Question 138

$$m = 2p+\sqrt{\frac{x}{y}}$$

Make x the subject of this formula.

$x =$ ..... [3]

Question 139

Solve the simultaneous equations.
You must show all your working.

$$3x-8y = 22$$
$$x+4y = 4$$

$x =$ .....

$y =$ ..... [3]

Question 140

Simplify.

$$\frac{ux-2u-x+2}{u^2-1}$$

..... [4]

Question 141

Write as a single fraction in its simplest form.

$$2-\frac{2x-1}{x+1}$$

..... [3]

Question 142

Solve the simultaneous equations.

$$2x+y=7$$
$$3x-y=8$$

$x =$ .....

$y =$ ..... [2]

Question 143

Factorise completely.

$$4-8x$$

..... [1]

Question 144

Solve the equation.

$$6-2x=3x$$

$x =$ ..... [2]

Question 145

Simplify.

$$\frac{x^2-5x}{2x^2-50}$$

..... [4]

Question 146

Factorise $6x^2+7x-20$.

..... [2]

Question 147

Make x the subject of this formula.

$$2y=5x-7$$

$x =$ ..... [2]

Question 148

Simplify.

$3a+7b-4a+b$

..... [2]

Question 149

Solve the simultaneous equations.
You must show all your working.

$x-y=7$

$x^2+y=149$

$x =$ ..... $y =$ .....

$x =$ ..... $y =$ ..... [5]

Question 150

Expand and simplify.

$6(t-q)-2(t-3q)$

..... [2]

Question 151

Solve.

$\frac{1}{x+1}+\frac{9}{x+9}=1$

$x =$ ..... or $x =$ ..... [5]

Question 152

Simplify.

$\frac{2x^2-5x-12}{3x^2-12x}$

..... [4]

Question 153

Expand and simplify.

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

..... [3]

Question 154

$$a = \frac{b^2}{5c}$$

Find b when $a = 5.625$ and $c = 2$.

$b =$ ..... [2]

Question 155

Make h the subject of the formula $2mh = g(1-h)$.

$h =$ ..... [4]

Question 156

Solve the simultaneous equations.
You must show all your working.

$$2x + y = 3$$
$$x - 5y = 40$$

$x =$ .....

$y =$ ..... [3]

Question 157

Simplify.

$$\frac{3x^2 - 18x}{ax - 6a + 2cx - 12c}$$

..... [4]

Question 158

Solve the simultaneous equations.
You must show all your working.

$$y = x^2 - 3x - 13$$
$$y = x - 1$$

$x =$ ..... , $y =$ .....

$x =$ ..... , $y =$ ..... [5]

Question 159

$P = M(g^2 + h^2)$

(a) Find the value of P when $M = 100$, $g = 3$ and $h = 4.5$.

$P =$ ..... [2]

(b) Rearrange the formula to write g in terms of P, M and h.

$g =$ ..... [3]

Question 160

Simplify.

$$\frac{3xy + 36y - 5x - 60}{2x^2 - 288}$$

..... [4]

Question 161

Expand and simplify.

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

..... [3]

Question 162

Solve the simultaneous equations.
You must show all your working.

$$y = x^2 - 9x + 21$$
$$y = 2x - 3$$

$x =$ ..... $y =$ .....

$x =$ ..... $y =$ ..... [5]

Question 163

Solve.

$$(5x-3)(2x+7) = 0$$

$x =$ ..... or $x =$ ..... [1]

Question 164

Write as a single fraction in its simplest form.

$$\frac{2}{x+3}-\frac{x+2}{7}$$

..... [3]

Question 165

$$y=\frac{3x-2}{1-x}$$

Make x the subject of the formula.

$x =$ ..... [4]

Question 166

Solve.

$$4-3x \geqslant \frac{6-x}{5}$$

..... [3]

Question 167

Solve the simultaneous equations.
You must show all your working.

$$4x-2y=-13$$
$$-3x+4y=\ \ 11$$

$x =$ .....

$y =$ ..... [3]

Question 168

Solve the simultaneous equations.
You must show all your working.

$$3x+y=11$$
$$x^2-2y=18$$

$x =$ ..... $y =$ .....

$x =$ ..... $y =$ ..... [5]

Question 169

Factorise completely.

$$12a^3 - 21a$$

..... [2]

Question 170

Simplify.

$$\frac{5x - x^2}{25 - x^2}$$

..... [3]

Question 171

Solve.

$$12x - 3 \geqslant 4x + 13$$

..... [2]

Question 172

Factorise completely.

(a) $18px - 27p$

..... [2]

(b) $mt - n - m + nt$

..... [2]

Question 173

Work out the value of $\frac{m\,k^3}{\sqrt{3}}$ when $m = 4$ and $k = 7$.

..... [2]

Question 174

Factorise completely.

(a) $2m+3p-8km-12kp$

..... [2]

(b) $5x^2-20y^2$

..... [3]

Question 175

The line $y=x+1$ intersects the graph of $y=x^2-3x-11$ at the points A and B.

Find the coordinates of A and the coordinates of B.
You must show all your working.

A (..... , ...)

B (..... , ...) [4]

Question 176

Factorise completely.

$1-q-a+aq$

..... [2]

Question 177

Factorise completely.

$14xy-7y^2$

..... [2]

Question 178

$s=\frac{1}{2}at^2$

(a) Work out the value of s when $a=0.9$ and $t=4$.

$s=$ ..... [1]

(b) Rearrange the formula to find t in terms of s and a.

$t=$ ..... [2]

Question 179

Expand and simplify.

$$(2x-1)(x+4)(x-3)$$

..... [3]

Question 180

Solve the simultaneous equations.

$$3x-2y=21$$
$$5x+2y=51$$

$x =$ .....

$y =$ ..... [2]

Question 181

Expand.

$$x(3+x^2)$$

..... [2]

Question 182

Simplify.

$$y\times 27-y\times 77$$

..... [1]

Question 183

Factorise completely.

(a) $1+x-y-xy$

..... [2]

(b) $2x^3-18xy^2$

..... [3]

Question 184

Expand and simplify.

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

..... [3]

Question 185

Solve the simultaneous equations.

$$x-3y=7$$
$$2x-3y=11$$

$x =$ .....

$y =$ ..... [2]

Question 186

Find the values of x when $6x+y=10$ and $y=x^2-3x+10$.

$x =$ ..... or $x =$ ..... [3]

Question 187

Solve the simultaneous equations.
You must show all your working.

$$3x-2y=19$$
$$x+y=3$$

$x =$ .....

$y =$ ..... [3]

Question 188

Solve.

(a) $15t+8=4-t$

$t =$ ..... [2]

(b) $\frac{25-2u}{3}=2$

$u =$ ..... [2]

Question 189

Factorise completely.

$$8g-2g^2$$

..... [2]

Question 190

Solve the equation $x^2+5x-7=0$.
You must show all your working and give your answers correct to 2 decimal places.

$x =$ ..... or $x =$ ..... [4]

Question 191

Simplify $d^8 \div d^2$.

..... [1]

Question 192

$$v = u - 9.8t$$

Find the value of v when $u = 4$ and $t = -7$.

$v =$ ..... [2]

Question 193

One solution of the equation $ax^2 + b = 181$ is $x = 8$.
a and b are both positive integers **greater than 1**.

(a) Find the value of b.

$b =$ ..... [2]

(b) Write down the other solution of the equation $ax^2 + b = 181$.

$x =$ ..... [1]

Question 194

Solve.

(a) $\frac{30}{x} = 6$

$x =$ ..... [1]

(b) $11x - 3 \geqslant 2(2x + 9)$

..... [3]

Question 195

Simplify $\left(81x^{12}\right)^{\frac{3}{4}}$.

..... [2]

Question 196

Simplify.

$$\left(64y^{27}\right)^{\frac{2}{3}}$$

..... [2]

Question 197

Find the coordinates of the point where the line $4x+y=9$ intersects the curve $y+x^2=5$.
You must show all your working.

(..... , ...) [5]

Question 198

$(x+a)(x+2)(2x+3)$ is equivalent to $2x^3+bx^2+cx-18$.

Find the value of each of a, b and c.

$a =$ .....

$b =$ .....

$c =$ ..... [3]

Question 199

$T=\sqrt{3d-e}$

Rearrange the formula to make d the subject.

$d =$ ..... [3]

Question 200

The line $y=x+1$ intersects the curve $y=x^2+x-3$ at two points.

Find the coordinates of the two points.

(..... , ...)

(..... , ...) [4]

Question 201

$y=2w^2-x$

Rearrange the formula to make w the subject.

$w =$ ..... [3]

Question 202

(a) $3^{3p}\times 3^{2p}=729$

Find the value of p.

$p =$ ..... [2]

(b) Simplify.

$(32x^{10})^{\frac{1}{5}}$

..... [2]

Question 203

Expand and simplify.

$$2(t+w)+3(w-t)$$

..... [2]

Question 204

$$v = u + at$$

Find the value of v when $u = 30$, $a = -2$ and $t = 7$.

$v =$ ..... [2]

Question 205

Simplify.

(a) $n^5 \times n$

..... [1]

(b) $8x^6 \div 2x^2$

..... [2]

(c) $(243y^{20})^{\frac{2}{5}}$

..... [2]

Question 206

Factorise completely.

(a) $42mk - 35m$

..... [2]

(b) $h^2 - 144$

..... [1]

Question 207

Complete these statements.

(a) When $x =$ ..... , $x+3=8$.

[1]

(b) When $7y=63$, $10y =$ .....

[1]

Question 208

$x^2-16x+a$ can be written in the form $(x+b)^2$.

Find the value of a and the value of b.

$a =$ .....

$b =$ ..... [2]

Question 209

(a) $\sqrt[5]{3} = 3^h$

Write down the value of h.

$h =$ ..... [1]

(b) Simplify $\left(4x^3\right)^3$.

..... [2]

Question 210

Simplify $4m+7k-m+3k$.

..... [2]

Question 211

$$A = \pi r^2 + \pi dh$$

Rearrange the formula to make h the subject.

$h =$ ..... [2]

Question 212

Simplify.

(a) $\dfrac{32g^{16}}{16g^8}$

..... [2]

(b) $\left(625k^8\right)^{\frac{3}{4}}$

..... [2]

Question 213

Solve the simultaneous equations.

$$5t-2w=19$$
$$3t+2w=5$$

$t =$ .....

$w =$ ..... [2]

Question 214

Factorise completely.

$$4x^2y-5xy^2$$

..... [2]

Question 215

Simplify.

$$7x-8y-x-y$$

..... [2]

Question 216

Solve the simultaneous equations.
You must show all your working.

$$4y+3x=13$$
$$y=x^2-18$$

$x =$ ..... $y =$ .....

or $x =$ ..... $y =$ ..... [5]

Question 217

Factorise completely.

(a) $12m^2-75t^2$

..... [3]

(b) $xy+15+3y+5x$

..... [2]

Question 218

Solve the simultaneous equations.
You must show all your working.

$$\frac{3x}{2} + 5y = 5$$
$$4x - 3y = 46$$

$x =$ .....

$y =$ ..... [4]