



Name: \_\_\_\_\_

Pre-assessment mark:

Pre-assessment level:

Question 1

VCMNA327 - Level 10

$p$  is inversely proportional to  $m$ . What is the constant of proportionality when  $p = 7$  and  $m = 21$ ?

147

3

14

$\frac{1}{2}$

Question 2

VCMNA328 - Level 10

How much would an investment with a principal amount of \$105 000 grow to, if it was compounded yearly at an interest rate of 5% p.a. after 2 years?

\$10 762.50

\$117 565.20

\$236 250.00

\$115 762.50

Question 3

VCMNA329 - Level 10

Which option shows this algebraic expression factorised correctly?

$$7n^4 - 3n^2$$

$4n^2$

$n^2(7n - 3)$

$4n^2(n - 1)$

$n^2(7n^2 - 3)$



Question 4

VCMNA330 - Level 10

Which answer shows this expression simplified?

$$30x^9 \div -3x^5$$

Question 5

VCMNA331 - Level 10

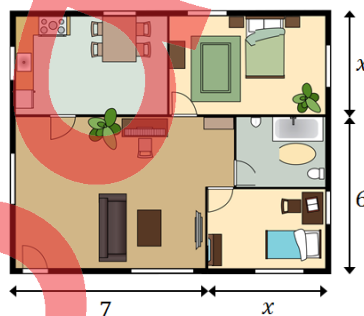
Which answer shows the algebraic fractions simplified correctly?

$$\frac{2y}{5} \times \frac{3y}{7}$$

Question 6

VCMNA332 - Level 10

What is the algebraic expression for the area of this house?



Area =

+

+



**Question 7**

VCMNA333 - Level 10

Solve for  $v$  when  $u = 3$ ,  $a = 15$  and  $t = 10$ .

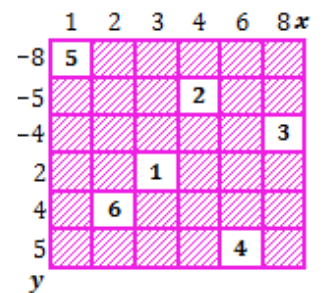
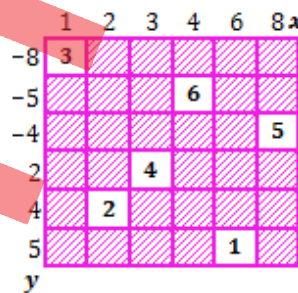
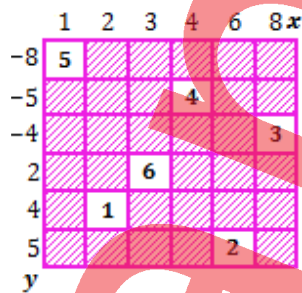
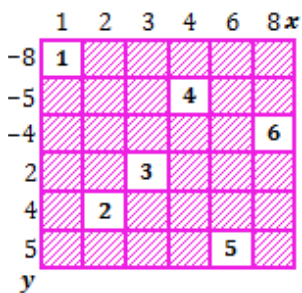
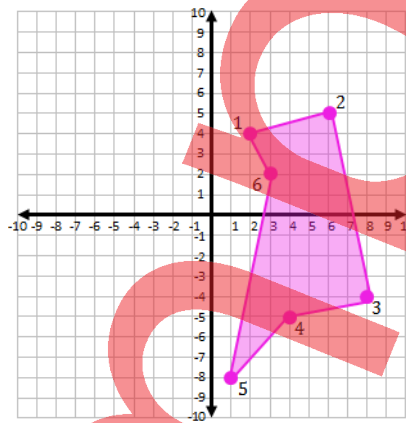
$$v = u + at$$

$v =$

**Question 8**

VCMNA334 - Level 10

Select the matching two-dimensional array for this diagram:



**Question 9**

VCMNA335 - Level 10

The area of a square window is  $9 \text{ m}^2$ . What is the perimeter of the window?



m



Question 10

VCMNA336 - Level 10

Which is the correct solution for the linear inequality?

$$-7 + 5x \geq -32$$

$x \geq -5$

$x \leq -5$

$x \geq -8$

$x \leq -8$

Question 11

VCMNA337 - Level 10

Circle the solutions to the simultaneous equations.

$$x + 4y = 19$$

$$5x + 4y = 15$$

$x = -1$

$y = 5$

$x = 3$

$y = 4$

$x = 2$

$y = 3$

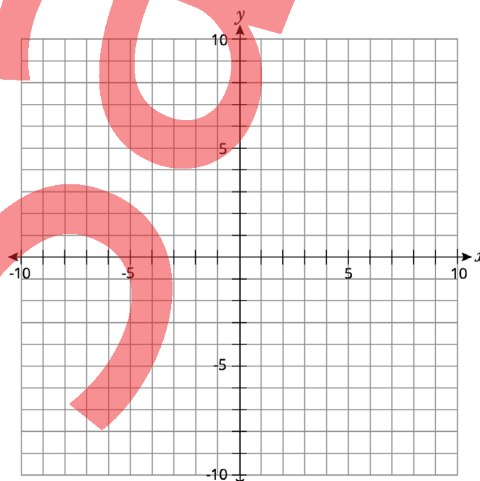
$x = -2$

$y = 4$

Question 12

VCMNA338 - Level 10

Plot the two points on a line that is parallel to the equation  $y = 3x - 2$  and passes through the coordinates of  $(3, 1)$ .

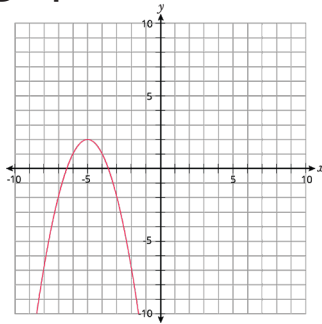




Question 13

VCMNA339 - Level 10

Which is the equation for this graph?



$y = (x - 5)^2 + 2$

$y = -(x + 5)^2 + 2$

$y = -(x - 5)^2 + 2$

$y = (x + 5)^2 + 2$

Question 14

VCMNA340 - Level 10

Solve for  $x$ .

$$\frac{x - 10}{5} = \frac{x - 4}{7}$$

$x =$

Question 15

VCMNA341 - Level 10

What are the solutions for this equation when  $y = 0$ ?

$$y = x^2 + 9x + 18$$

$x = -6$  or  $x = 3$

$x = -9$  or  $x = 2$

$x = -18$  or  $x = -1$

$x = -6$  or  $x = -3$



Question 16

VCMNA342 - Level 10

Which equation matches the solution  $x = -8$ ?

$$\frac{x + 7}{-2} = 6$$

$$\frac{x - 9}{6} = -11$$

$$-12 = \frac{3x - 60}{7}$$

$$15 = \frac{-6x - 9}{3}$$

Question 17

VCMNA355 - Level 11

Which expression shows the addition of these surds written in simplest form?

$$\sqrt{12} + \sqrt{27}$$

$$\sqrt{39}$$

$$5\sqrt{3}$$

$$13\sqrt{3}$$

$$5\sqrt{6}$$

Question 18

VCMNA356 - Level 11

Complete:

$$\log_4 2 + \log_4 5 =$$

$$\log_{16} 10$$

$$\log_4 7$$

$$\log_8 7$$

$$\log_4 10$$



Question 19

VCMNA357 - Level 11

What is the quotient and remainder when:

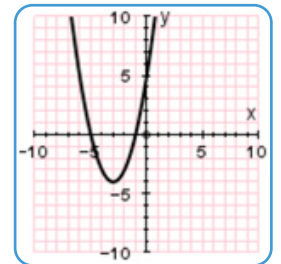
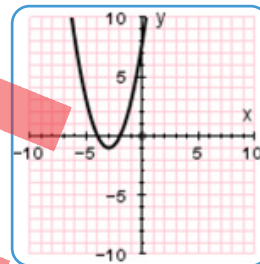
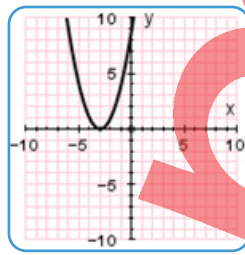
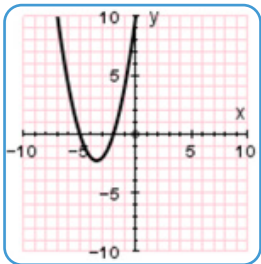
$$x^3 + 4x^2 - 5x + 4 \text{ is divided by } x + 2$$

Question 20

VCMNA359 - Level 11

What is the graph of this equation?

$$y = x^2 + 6x + 5$$



Question 21

VCMNA360 - Level 11

Solve for  $x$ .

$$4^{5x+9} = 16^{4x}$$

$x =$

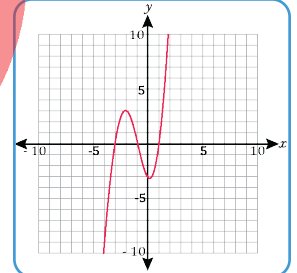
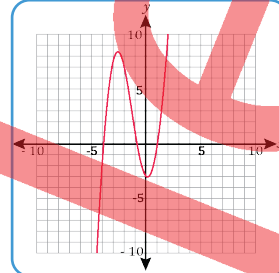
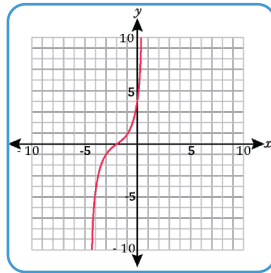
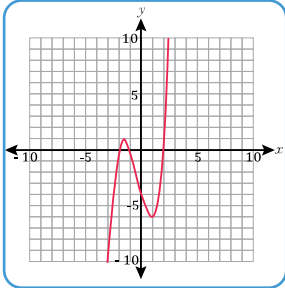


Question 22

VCMNA361 - Level 11

Which is the graph of the polynomial?

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



Question 23

VCMNA362 - Level 11

Which answer shows the quadratic expression factorised correctly by completing the square?

$$x^2 + 6x + 1$$

$$(x + 3 - \sqrt{8})(x + 3 + \sqrt{8})$$

$$(x + 6 - \sqrt{37})(x + 6 + \sqrt{37})$$

$$(x + 3 - \sqrt{10})(x + 3 + \sqrt{10})$$

$$(x + 3 - \sqrt{35})(x + 3 + \sqrt{35})$$





### Teacher reference

\* 1 mark for each correct answer

Question	Sub-Strand	Victorian Curriculum	Content Description
1	Real Numbers	Level 10	Solve simple problems involving inverse proportion (VCMNA327)
2	Money and Financial Mathematics	Level 10	Connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies (VCMNA328)
3	Patterns and Algebra	Level 10	Factorise algebraic expressions by taking out a common algebraic factor (VCMNA329)
4	Patterns and Algebra	Level 10	Simplify algebraic products and quotients using index laws (VCMNA330)
5	Patterns and Algebra	Level 10	Apply the four operations to simple algebraic fractions with numerical denominators (VCMNA331)
6	Patterns and Algebra	Level 10	Expand binomial products and factorise monic quadratic expressions using a variety of strategies (VCMNA332)
7	Patterns and Algebra	Level 10	Substitute values into formulas to determine an unknown and re-arrange formulas to solve for a particular term (VCMNA333)
8	Patterns and Algebra	Level 10	Implement algorithms using data structures in a general-purpose programming language (VCMNA334)
9	Linear and Non-Linear Relationships	Level 10	Solve problems involving linear equations, including those derived from formulas (VCMNA335)
10	Linear and Non-Linear Relationships	Level 10	Solve linear inequalities and graph their solutions on a number line (VCMNA336)
11	Linear and Non-Linear Relationships	Level 10	Solve simultaneous linear equations, using algebraic and graphical techniques including using digital technology (VCMNA337)
12	Linear and Non-Linear Relationships	Level 10	Solve problems involving gradients of parallel and perpendicular lines (VCMNA338)
13	Linear and Non-Linear Relationships	Level 10	Explore the connection between algebraic and graphical representations of relations such as simple quadratic, reciprocal, circle and exponential, using digital technology as appropriate (VCMNA339)
14	Linear and Non-Linear Relationships	Level 10	Solve linear equations involving simple algebraic fractions (VCMNA340)
15	Linear and Non-Linear Relationships	Level 10	Solve simple quadratic equations using a range of strategies (VCMNA341)
16	Linear and Non-Linear Relationships	Level 10	Solve equations using systematic guess-check-and-refine with digital technology (VCMNA342)
17	Real Numbers	Level 11	Define rational and irrational numbers and perform operations with surds and fractional indices (VCMNA355)
18	Real Numbers	Level 11	Use the definition of a logarithm to establish and apply the laws of logarithms and investigate logarithmic scales in measurement (VCMNA356)



# EssentialAssessment™

## Victorian Curriculum Pre-Assessment

Number and Algebra — General All

\* 1 mark for each correct answer

Question	Sub-Strand	Victorian Curriculum	Content Description
19	Patterns and Algebra	Level 11	Investigate the concept of a polynomial and apply the factor and remainder theorems to solve problems (VCMNA357)
20	Linear and Non-Linear Relationships	Level 11	Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations (VCMNA359)
21	Linear and Non-Linear Relationships	Level 11	Solve simple exponential equations (VCMNA360)
22	Linear and Non-Linear Relationships	Level 11	Apply understanding of polynomials to sketch a range of curves and describe the features of these curves from their equation (VCMNA361)
23	Linear and Non-Linear Relationships	Level 11	Factorise monic and non-monic quadratic expressions and solve a wide range of quadratic equations derived from a variety of contexts (VCMNA362)

Sample



Input your student assessment results within your Essential Assessment account to generate differentiated:

Curriculum data views

Paper-based Numeracy Learning Plans

My Numeracy activities



ID: 240

©Essential Assessment 2012-2021