Semester review 1

Integers

Multiple-choice questions

1 $156 \div 4$ is the same as:

A $156 \div 2 \times 2$ B $156 \div 2 \div 2$ C $312 \div 2$ D $156 \times 2 \div 2$

2 $-24 + 6 \times (-3)$ is equal to:

A 6 B 42 C -42 D -6

3 What is the smallest number that can be added to 1923 to make the answer divisible by 9?

A 1 B 2 C 3 D 4

4 $(-15)^2$ equals:

A 225 B 30 C -30 D -225

5 Two numbers have a sum of -10 and a product of -56. The larger of the two numbers is:

A -4 B 4 C 14 D -14

Short-answer questions

1 Evaluate, without using a calculator:

a $4973 + 196$ b $1506 - 156$ c -96×3

d 139×5 e 14×99 f $14 \times 99 + 14 \times 101$

g 9^2 h 4^3 i $-9 - 7 - 3$

2 Evaluate:

a $10 - 6 \times 4$ b $15 \times 4 \div 2$ c $24 \div 2 \times 6$

d $-3 + (-10 - (-6))$ e $-81 \div (-3) \times 2$ f $73 - 72 - 7$

3 Find the HCF of:

a 24 and 42 b 35 and 42 c 100 and 60

d 15, 45 and 36

4 Write down the LCM of:

a 24 and 42 b 8 and 9 c 100 and 60

d $7^2 \times 5^2 \times 3^3$ and $2 \times 7^2 \times 5 \times 3^2$

5 If $a = -5$, $b = 4$ and $c = -2$, evaluate these expressions.

a $a + b + c$ b abc c $a^2 - c$

d $5(a - b + c)$ e a^2 f c^3

g $\dfrac{8a + \sqrt{b}}{c}$

Extended-response question

The weather for a November day is given for different cities around the world.

	Minimum (°C)	Maximum (°C)
Amsterdam	3	12
Auckland	11	18
LA	8	14
Hong Kong	16	28
Moscow	6	8
Beijing	–3	0
New York	8	10
Paris	6	13
Tel Aviv	16	23
Wollongong	18	22

a Which city recorded the highest temperature on the day shown in the table?

b Which two cities only had a two-degree variance in temperature?

c Which city had the largest variance in temperature on this November day?

d What was the mean (average) minimum temperature for the 10 cities listed in the table?

e What was the mean (average) maximum temperature?

f If Bangkok's temperature of 29 to 34 degrees were added to the table, what effect would this have on the means?

Lines, shapes and solids

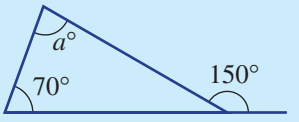
Multiple-choice questions

1 The supplementary angle to 80° is:

A 10° **B** 100° **C** 280° **D** 20°

2 In this diagram a equals:

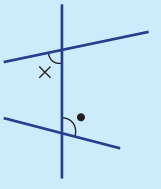
A 150 **B** 220 **C** 70 **D** 80



3 The interior angle of a regular pentagon is:

A 72° **B** 540° **C** 108° **D** 120°

4 Which diagram shows equal alternate angles?

A


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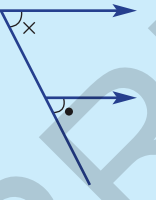

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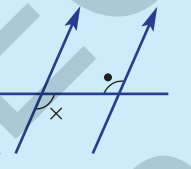

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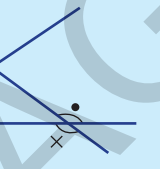
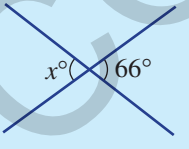


5 A polyhedron with 5 vertices, 8 edges and 5 faces could be described as a:

A triangular pyramid **B** square prism
C square pyramid **D** triangular prism

Short-answer questions

1 Find the value of x.

a


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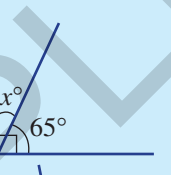

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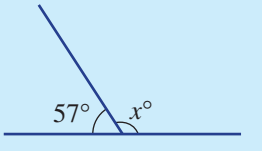

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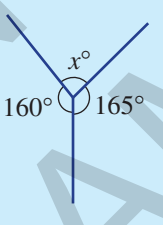

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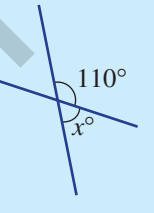

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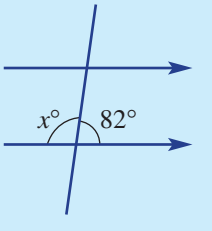
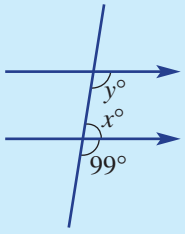


2 Find the value of each pronumeral.

a



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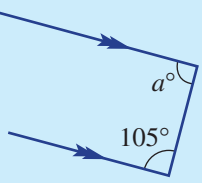

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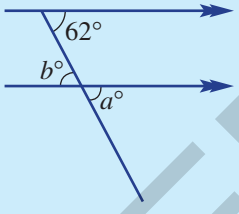

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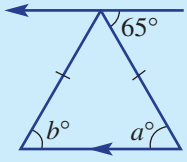

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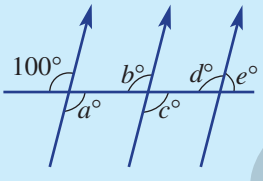

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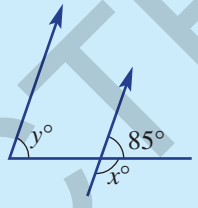
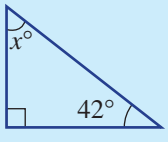


3 Find the value of the pronumeral in these triangles.

a



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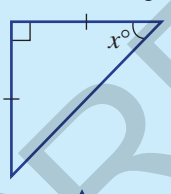

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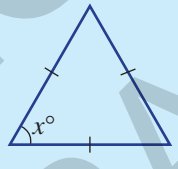

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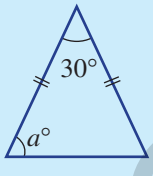

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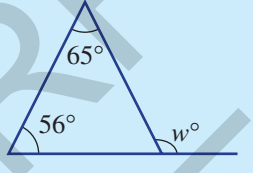

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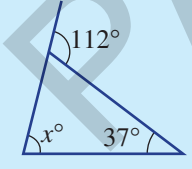
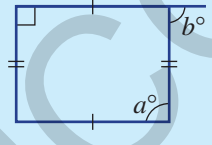


4 Find the value of a and b in these quadrilaterals.

a



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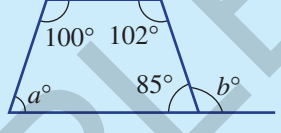

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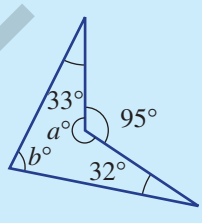
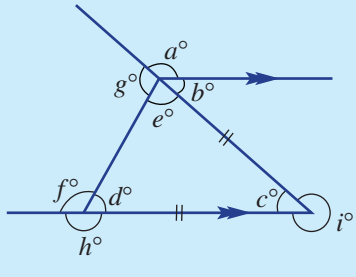


5 Find the interior angle of a regular hexagon.

Extended-response question

If $a = 115$, find the size of each angle marked. Give a reason for each answer. Write your answers in the order you found them.

Is the order the same for everybody in the class? Discuss any differences and the reasons associated with each.



Fractions, decimals and percentages

Multiple-choice questions

1 $\frac{150}{350}$ simplifies to:

A $\frac{6}{14}$ **B** $\frac{3}{70}$ **C** $\frac{15}{35}$ **D** $\frac{3}{7}$

2 Sienna spends $\frac{3}{7}$ of \$280 her income on clothes and saves the rest. She saves:

A \$470 **B** \$120 **C** \$160 **D** \$2613

3 0.008×0.07 is equal to:

A 0.056 **B** 0.0056 **C** 0.00056 **D** 56

4 0.24 expressed as a fraction is:

A $\frac{1}{24}$ **B** $\frac{6}{25}$ **C** $\frac{12}{5}$ **D** $\frac{24}{10}$

5 If 5% of $x = y$, then 10% of $2x$ equals:

A $\frac{1}{2}y$ **B** $2y$ **C** $4y$ **D** $10y$

Short-answer questions

1 Copy and complete these equivalent fractions.

a $\frac{3}{5} = \frac{\square}{30}$ **b** $\frac{\square}{11} = \frac{5}{55}$ **c** $1\frac{4}{6} = \frac{\square}{3}$

2 Evaluate each of the following.

a $\frac{3}{4} - \frac{1}{2}$ **b** $\frac{4}{5} + \frac{3}{5}$ **c** $1\frac{1}{2} + 1\frac{3}{4}$

d $\frac{4}{7} - \frac{2}{3}$ **e** $\frac{4}{9} \times \frac{3}{4}$ **f** $1\frac{1}{2} \times \frac{3}{5}$

3 Write the reciprocal of:

a $\frac{2}{5}$ **b** 8 **c** $4\frac{1}{5}$

4 Evaluate:

a $2\frac{1}{2} \times 1\frac{4}{5}$ **b** $1\frac{1}{2} \div 2$ **c** $1\frac{1}{2} \times \frac{1}{4} \div \frac{3}{5}$

5 Calculate each of the following.

a $3.84 + 3.09$ **b** $10.85 - 3.27$ **c** $12.09 \div 3$

d $6.59 - 0.2 \times 0.4$ **e** 96.37×40 **f** $15.84 \div 0.02$

6 Evaluate:

a 5.3×103 **b** 9.6×105 **c** $61.4 \div 100$

7 Copy and complete this table of decimals, fractions and percentages.

Fraction	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{5}$	$\frac{1}{3}$	$\frac{2}{3}$				
Decimal								0.99	0.005
Percentage						80%	95%		

8 Find:

a 10% of 56 **b** 12% of 98 **c** 15% of 570 m

d 99% of \$2 **e** $12\frac{1}{2}$% of \$840 **f** 58% of 8500 g

9 **a** Increase \$560 by 25%.

b Decrease \$980 by 12%.

c Increase \$1 by 8% and then decrease the result by 8%.

10 A \$348 Charlie Brown dress sold for \$261. This represents a saving of x%. What is the value of x?

Extended-response question

A laptop decreases in value by 15% a year.

a Find the value of a \$2099 laptop at the end of:

i 1 year **ii** 2 years **iii** 3 years

b After how many years is the laptop worth less than \$800?

c Is the laptop ever going to have a value of zero dollars? Explain.

Measurement and introduction to Pythagoras' theorem

Multiple-choice questions

1 A cube has a volume of 8 cubic metres. The surface area of this cube is:

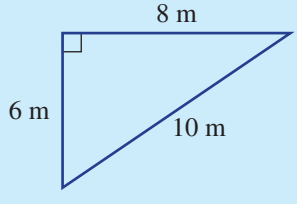
A 2 m^2 **B** 4 m^2

C 24 m^2 **D** 384 m^2

2 The area of this triangle is:

A 48 m^2 **B** 24 m^2

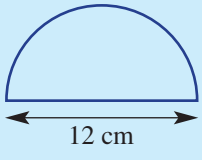
C 30 m^2 **D** 40 m^2



3 The perimeter of this semicircle is closest to:

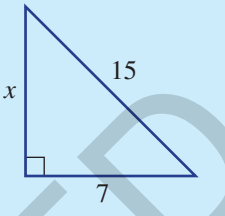
A 38 cm **B** 30 cm

C 19 cm **D** 31 cm



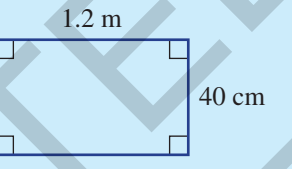
4 The value of x in this triangle is closest to:

A 176 **B** 13
C 274 **D** 17



5 The area of this rectangle is:

A 48 m^2 **B** 48 000 cm^2
C 480 cm^2 **D** 0.48 m^2



Short-answer questions

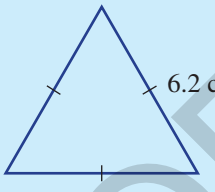
1 Complete these conversions.

a 5 m = _____cm **b** 1.8 m = _____cm **c** 9 m^2 = _____cm^2

d 1800 mm = _____m **e** 4 L = _____cm^3 **f** $\frac{1}{100}$ km^2 = _____m^2

2 Find the perimeter of these shapes.

a



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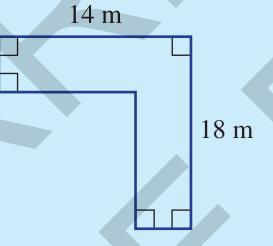

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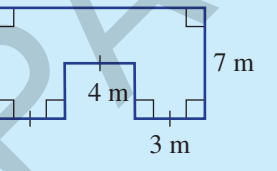
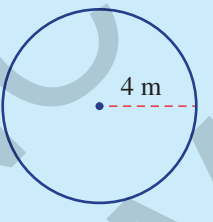


3 Find correct to two decimal places:

i the circumference **ii** the area

a



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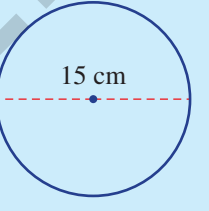

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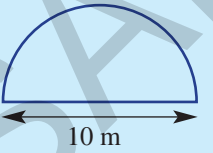

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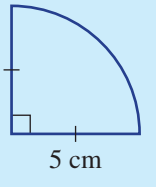

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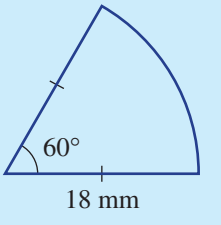
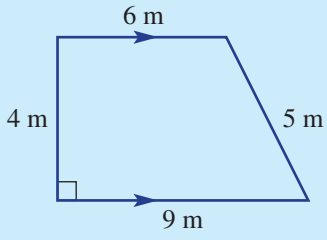


5 Find the area of these shapes.

a



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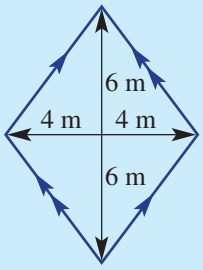
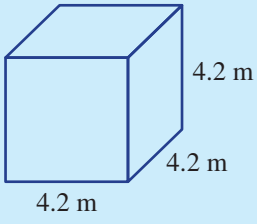


6 Find the surface area and volume of these solids.

a



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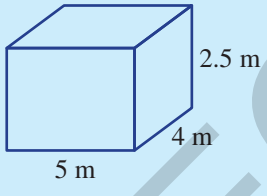
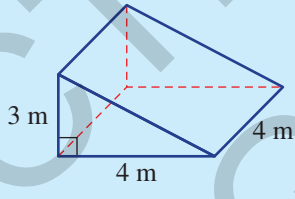
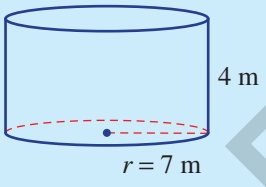


c

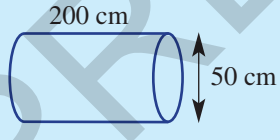


7 Find the volume of each cylinder correct to two decimal places.

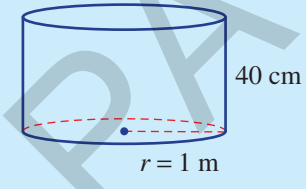
a



b

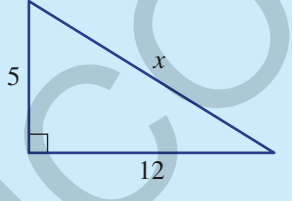


c

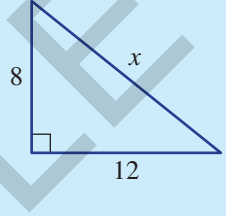


8 Find the value of x in these triangles. Round to two decimal places for part **b**.

a



b

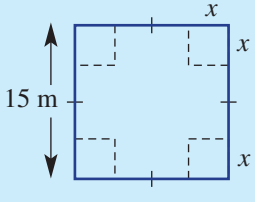


9 Write these times using 24-hour time.

a 3:30 p.m. **b** 7:35 a.m.

Extended-response question

A square sheet of metal 15 m by 15 m has equal squares of sides x m cut from each corner as shown. It is then folded to form an open tray.



a What is the length of the base of the tray? Write an expression.

b What is the height of the tray?

c Write an expression for the volume of the tray.

d If $x = 1$, find the volume of the tray.

e What value of x do you think produces the maximum volume?

Algebra

Multiple-choice questions

1 $8^3 \times 8^4$ is the same as:

A 8^{-1} **B** 64^7 **C** 8^7 **D** 8^{12}

2 $4x + 5 + 3x$ is the same as:

A $7x + 5$ **B** $12x$ **C** $12 + x^2$ **D** $2x + 12$

3 $12m + 18$ factorises to:

A $2(6m - 9)$ **B** $-6(2m - 3)$ **C** $6(3 - 2m)$ **D** $6(2m + 3)$

4 $5a + 5 - 4a - 4 - a - 1$ equals:

A $a - 1$ **B** 0 **C** $2 - a$ **D** $a + 1$

5 Which answer is NOT equivalent to $(m \times n) \div (p \times q)$?

A $\frac{mn}{pq}$ **B** $m \times \frac{n}{pq}$ **C** $\frac{m}{p} \times \frac{n}{q}$ **D** $\frac{mnq}{p}$

Short-answer questions

1 Write an expression for:

a the sum of p and q **b** the product of p and 3

c half the square of m **d** the sum of x and y, divided by 2

2 If $a = 6$, $b = 4$ and $c = -1$, evaluate:

a $a + b + c$ **b** $ab - c$ **c** $a(b^2 - c)$

d $3a^2 + 2b$ **e** abc **f** $\frac{ab}{c}$

3 Simplify each algebraic expression.

a $4 \times 6k$ **b** $a + a + a$ **c** $a \times a \times a$ **d** $7p \div 14$

e $3ab + 2 + 4ab$ **f** $7x + 9 - 6x - 10$ **g** $18xy \div 9x$ **h** $m + n - 3m + n$

4 Simplify:

a $\frac{5xy}{5}$ **b** $\frac{3x}{7} - \frac{2x}{7}$ **c** $\frac{w}{5} + \frac{w}{2}$ **d** $3a + \frac{a}{2}$

5 Simplify:

a $\frac{m}{5} \times \frac{5}{6}$ **b** $\frac{ab}{7} \div \frac{1}{7}$ **c** $\frac{m}{3} \times \frac{n}{2} \div \frac{mn}{4}$

6 Expand, and simplify where necessary.

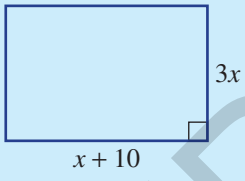
a $6(2m - 3)$ **b** $10 + 2(m - 3)$ **c** $5(A + 2) + 4(A - 1)$

7 Factorise:

a $18a - 12$ **b** $6m^2 + 6m$ **c** $-8m^2 - 16mn$

8 Write an expression for the rectangle's:

a perimeter **b** area



9 Simplify:

a $m^7 \times m^2$ **b** $8a^3 \times 4a$ **c** $12a^4b^6 \times (-4a^2b^3)$

d $a^{12} \div a^6$ **e** $a^7b^4 \div (a^3b^2)$ **f** $5a^6 \div (10a^6)$

10 Simplify:

a $(x^7)^2$ **b** $(2a^3)^4$ **c** $(-5a^4b^6)^2$

d x^0 **e** $(3x^2)^0$ **f** $-5(ab)^0c^2$

Extended-response question

a Write an expression for the perimeter of this triangle.

b Write an expression for the area of this triangle.

c Use Pythagoras' theorem to find a relationship between x and a.

d Use your relationship to write an expression for the perimeter in terms of only a.

e If the perimeter equals 72 cm, what is the area of this triangle?