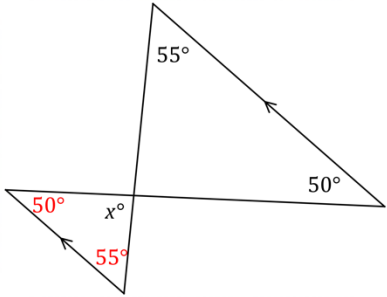
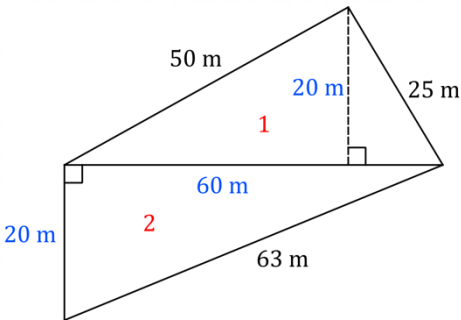
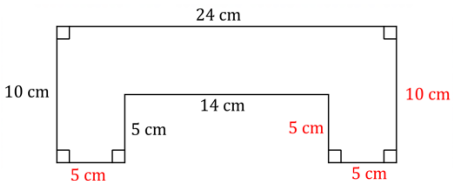
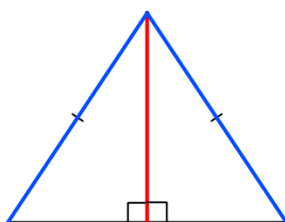
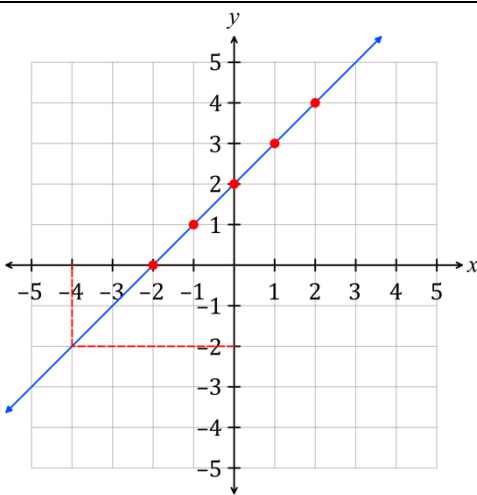


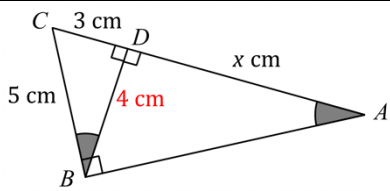
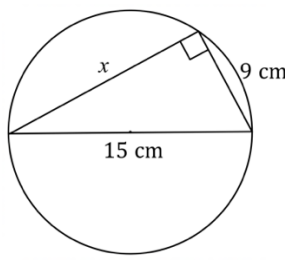
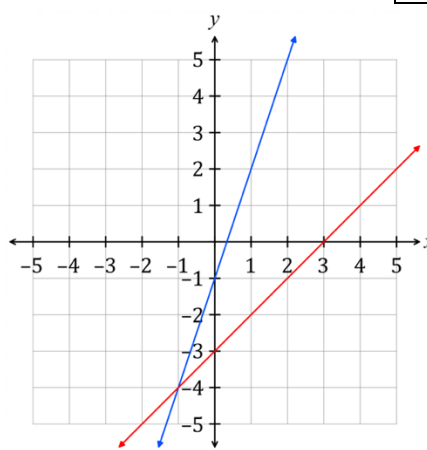
ACE Examination 2018
Year 8 Mathematics Yearly Examination
Worked solutions and marking guidelines

Section I		
	Solution	Criteria
1.	$I = Prn$ $= \$500 \times 0.08 \times 3$ $= \$120$	1 Mark: D
2.	Alternate angles are equal given two parallel lines. $x + 55^\circ + 50^\circ = 180^\circ$ $x^\circ = 75^\circ$ (Angles sum of a triangle is 180°) 	1 Mark: B
3.	Total number of students in the roll call is 25. $\text{Percentage absent} = \frac{4}{25} \times 100$ $= 16\%$	1 Mark: A
4.	A $2 = 2 \times 0 - 1$ False B $-2 = 2 \times 0 - 1$ False C $1 = 2 \times 0 - 1$ False D $-1 = 2 \times 0 - 1$ True	1 Mark: D
5.	$y + 3 + 2(3y - 5) = y + 3 + 6y - 10$ $= 7y - 7$	1 Mark: A
6.	$P(\text{Wet}) = 0.25 = \frac{1}{4}$ $P(\text{Not wet}) = 1 - \frac{1}{4} = \frac{3}{4}$	1 Mark: D
7.	Total number of parts $= 2 + 3 = 5$ $\text{Harry's share} = \frac{3}{5} \times \12000 $= \$7200$	1 Mark: D
8.	Area 1 $A = \frac{1}{2}bh$ $= \frac{1}{2} \times 60 \times 20 = 600 \text{ m}^2$ Area 2 $A = \frac{1}{2}bh$ $= \frac{1}{2} \times 60 \times 20 = 600 \text{ m}^2$ $\therefore$ Total area $= 1200 \text{ m}^2$ 	1 Mark: B
9.	$(5x^2 \times 8y^4) \div (4x^0 \times 3y^2) = \frac{40x^2 y^4}{12x^0 y^2}$ $= \frac{10x^2 y^2}{3}$	1 Mark: B

	Solution	Criteria
10.	$63 \text{ mm} : 72 \text{ cm} = 63 : 72 \times 10$ $= 63 : 720$ $= 7 : 80$	1 Mark: C
11.	Both equations have the same y value $3x - 1 = 4x + 2$ $-x = 3$ $x = -3$ Alternatively substitute each x value into both equations.	1 Mark: A
12.	$\text{Mean} = \frac{2 \times 5 + 7 \times 10 + 12 \times 3 + 17 \times 2}{20}$ $= 7.5$	1 Mark: C
13.	$P = 24 + 10 + 5 + 5$ $+ 14 + 5 + 5 + 10$ $= 78 \text{ cm}$ 	1 Mark: C
14.	One-quarter (25%) of the students choose tennis Number of students $= 0.25 \times 120$ $= 30$	1 Mark: A
15.	Vertical lines have the same x values. $\therefore x = -10$	1 Mark: C
16.	$a + 2a + 3a + 4a = 360$ $10a = 360$ $a = 36$ (Angles sum of a quadrilateral is 360°)	1 Mark: A
17.	$\frac{4x}{8} - \frac{x}{8} = \frac{4x - x}{8}$ $= \frac{3x}{8}$	1 Mark: C
18.	$A = \frac{1}{4} \pi r^2$ $= \frac{1}{4} \times \pi \times 10^2$ $= 78.5398 \dots$ $\approx 78.5 \text{ cm}^2$	1 Mark: B
19.	The value of y increases by 4 when x increases by 2. When $x = 0$ then $y = 4$ $\therefore y = 2x + 4$	1 Mark: B
20.	$x\% \text{ of } \$y = \frac{x}{100} \times \y $= \$\left(\frac{xy}{100}\right)$	1 Mark: D

Section II Part A		
	Solution	Criteria
21(a)	Amount = $(1.10 \times \$100) \times 0.90$ = \$99	1 mark: Correct answer.
21(b) (i)	$18 : 6 = 3 \times 6 : 1 \times 6$ = $3 : 1$	1 mark: Correct answer.
21(b) (ii)	$0.7 : 2 = 0.7 \times 10 : 2 \times 10$ = $7 : 20$	1 mark: Correct answer.
21(c)	$C = \pi d$ = $\pi \times 4$ = 12.5663... ≈ 12.6 m $\therefore$ The circumference of the pond is 12.6 metres.	1 mark: Correct answer.
21(d)	Angles sum of pentagon is $(2 \times 5 - 4) \times 90^\circ$ or 540° Exterior angle = $180^\circ - \frac{540^\circ}{5}$ = 72°	1 mark: Correct answer.
22(a) (i)	$a - 5 = 32$ $a = 37$	1 mark: Correct answer.
22(a) (ii)	$3m + 10 = 5m - 6$ $-2m + 10 = -6$ $-2m = -16$ $m = 8$	1 mark: Correct answer.
22(a) (iii)	$5(x - 8) = 60$ $x - 8 = 12$ $x = 20$	1 mark: Correct answer.
22(b)	Speed = $\frac{\text{Distance}}{\text{Time}}$ $75 = \frac{300}{t}$ $t = \frac{300}{75}$ = 4 hours	1 mark: Correct answer.
22(c)	Pythagoras theorem $16^2 = x^2 + 6^2$ $x^2 = 16^2 - 6^2$ = 220 $x = \sqrt{220}$ = 14.8323 ... ≈ 14.8 cm	1 mark: Correct answer.

23(a)	Congruence test RHS (Right-angle, Hypotenuse, Side)		1 mark: Correct answer.												
23(b) (i)	Mode is the score that occurs the most. ∴ Mode is 20		1 mark: Correct answer.												
23(b) (ii)	Arrange the scores in increasing order. 19, 20, 20, 20, 21 , 22 , 24, 24, 25, 25 ∴ Median is 21.5		1 mark: Correct answer.												
23(b) (iii)	Mean = $\frac{25 + 21 + 22 + 20 + 19 + 24 + 20 + 25 + 20 + 24}{10}$ = 22 Alternatively use the statistics mode on the calculator.		1 mark: Correct answer.												
23(c)	Average speed = $\frac{\text{Distance}}{\text{Time}}$ $= \frac{1058}{11.5}$ = 92 km/h		1 mark: Correct answer.												
24(a) (i)	<table border="1"><tr><td>x</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td></tr><tr><td>y</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr></table>	x	-2	-1	0	1	2	y	0	1	2	3	4		1 mark: Correct answer.
x	-2	-1	0	1	2										
y	0	1	2	3	4										
24(a) (ii)			1 mark: Correct answer.												
24(a) (iii)	When y = -2 from the graph x = -4		1 mark: Correct answer.												
24(a) (iv)	y = x + 2 = -7 + 2 = -5		1 mark: Correct answer.												
24(b)	Total number of parts = 1 + 2 + 3 = 6 Percentage sand = $\frac{2}{6} \times 100$ = 33 $\frac{1}{3}$ %		1 mark: Correct answer.												

Section II Part B Advanced																		
25(a)	$(x + 30) + 2x + 2x + x = 360$ $6x + 30 = 360$ $6x = 330$ $x = 55$	1 mark: Correct answer.																
25(b)	$\text{Mean} = \frac{\text{Sum of the scores}}{\text{Total number of scores}}$ $73 = \frac{\text{Sum of the scores}}{8}$ Sum of the scores = $73 \times 8 = 584$. Let the score in the ninth test be x. $75 = \frac{584 + x}{9}$$675 = 584 + x \text{ or } x = 91\%$ $\therefore$ Alexander needs to score 91% in the ninth test.	1 mark: Correct answer.																
25(c) (i)	In $\triangle BCD$ and $\triangle ABD$ $\angle BCD = \angle BCA$ (Same angles) $\angle CDB = \angle BDA$ (Right angles) $\therefore \triangle BCD \sim \triangle ABD$ (Equiangular)	1 mark: Correct answer.																
25(c) (ii)	AD = 4 cm (Pythagoras theorem) Similar triangles $\frac{x}{4} = \frac{4}{3}$ $x = \frac{4 \times 4}{3} = \frac{16}{3} = 5\frac{1}{3} \text{ cm}$ 	2 marks: Correct answer 1 mark: Shows some understanding of the problem.																
26(a)	Pythagoras theorem $15^2 = x^2 + 9^2$ $x^2 = 15^2 - 9^2$ $x = 12 \text{ cm}$ $P = 12 + 15 + 9$ $= 36 \text{ cm}$ $\therefore$ Perimeter of the triangles is 36 cm 	2 marks: Correct answer 1 mark: Draws a diagram with correct data or shows some understanding																
26(b) (i)	$3x - y - 1 = 0$ <table border="1" data-bbox="684 1328 1106 1408"><tr><td>x</td><td>0</td><td>1</td><td>2</td></tr><tr><td>y</td><td>-1</td><td>2</td><td>5</td></tr></table> $y = x - 3$ <table border="1" data-bbox="684 1431 1106 1509"><tr><td>x</td><td>0</td><td>1</td><td>2</td></tr><tr><td>y</td><td>-3</td><td>-2</td><td>-1</td></tr></table> 	x	0	1	2	y	-1	2	5	x	0	1	2	y	-3	-2	-1	2 marks: Correct answer. 1 mark: Graphs one of the lines correctly or constructs the table of ordered pairs.
x	0	1	2															
y	-1	2	5															
x	0	1	2															
y	-3	-2	-1															
26(b) (ii)	$\therefore$ Point of intersection is $(-1, -4)$	1 mark: Correct answer.																