Name: FILE Maths Class: .....

SYDNEY TECHNICAL HIGH SCHOOL

Year 8
Mathematics

Common Test

Assessment 1

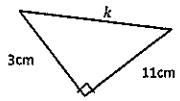
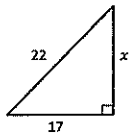
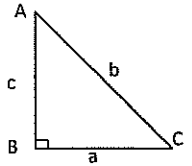
May, 2016

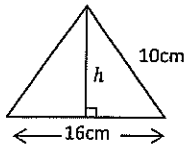
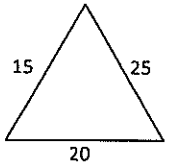
Time allowed: 70 minutes

General Instructions:

- Marks for each question are indicated on the question.
- Approved calculators may be used
- All necessary working should be shown
- Full marks may not be awarded for careless work or illegible writing
- Write using black or blue pen
- Write your answers in the space provided

Question 1 Pythagoras	/14	/2
Question 2 Percentages	/15	/2
Question 3 Algebra	/15	/5
Question 4 Geometry	/15	/2
TOTAL		/70

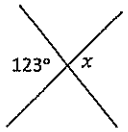
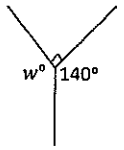
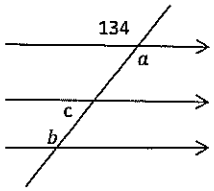
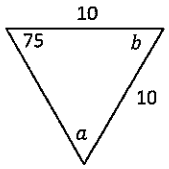
QUESTION 1 PYTHAGORAS THEOREM (14 marks)		ANSWERS
1.	Find the value of k correct to 2 decimal places 	
2.	Find the value of x leaving your answer in exact form 	
3.	Is 5, 12, 14 a Pythagorean Triad?	
4.	Which statements are true for this triangle (more than 1 is possible)?  A. $AB^2 = BC^2 + CA^2$ B. $AC^2 = BC^2 + AB^2$ C. $a^2 = b^2 + c^2$ D. $b^2 = c^2 + a^2$ E. $c^2 = a^2 + b^2$	
5.	Find the length of the diagonal in a rectangle with length 8.5cm and width 4.7cm. Answer correct to 1 decimal place.	

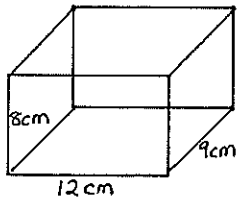
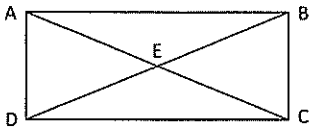
6.	Find the height in cm of this isosceles triangle  	
7.	Mary walks due west away from school at a speed of 3km per hour. Her friend Margaret walks due north from the school at a speed of 4km per hour. How far apart are the girls after 90 minutes?	
8.	The triangle below is NOT drawn to scale. Is it right-angled? Give reasons for your answer  	

QUESTION 2	PERCENTAGES (15 marks)	ANSWERS
1.	Convert $3\frac{3}{5}$ % to a fraction in simplest form	
2.	Arrange these numbers in ascending order $\frac{9}{20}$, 42.6%, $\frac{2}{5}$, 0.46	
3.	Find 27.3% of 4L	
4.	What percentage is 219cm of 6m?	
5.	Decrease 240t by 28%	
6.	Find the number if 15% of the number is 114	
7.	The cost of a coffee table was marked up from $160 to $184. Find the percentage mark up.	

8.	A salesman is paid a weekly wage of \$110 plus commission of 17% on his sales. Find his total pay for a week in which his sales totalled \$2300.	
9.	At a children's party, 36% of the children present were boys. If there were 32 girls at the party, how many children were at the party?	
10.	Find the simple interest earned on \$457 at $6\frac{1}{4}$% for 6 months.	
11.	Increase \$60 by 20% then decrease the result by 20%	

QUESTION 3	ALGEBRA (15 marks)	ANSWERS
1.	Simplify $5p - 3q - 5p - 3q$	
2.	Simplify $30a^2 b \div 6ab$	
3.	Simplify $8f + 42ef^2 \div 7ef$	
4.	Expand and simplify a) $9(4x - 7) + 3x$	
	b) $(3x - 2)^2$	
5.	Simplify a) $\frac{x}{5} + \frac{x}{3}$	
	b) $\frac{ab}{30c} \div \frac{ac}{55}$	
	c) $3y^5 \times 7y^{11}$	
	d) $(3x^4)^3$	
	e) $3^8 \div 3^2$	
6.	Factorise a) $5ab - 20ac$ b) $-8a^2 + 12a$	a) _____ b) _____

QUESTION 4	GEOMETRY (15 marks)	ANSWERS
1.	The supplement of $75°$ is	
2.	Find the value of the pronumerals giving reasons a) 	x = _____ Reason = _____
	b) 	w = _____ Reason = _____
	c) 	a = _____ Reason = _____ b = _____ Reason = _____ c = _____ Reason = _____
	d) 	a = _____ Reason = _____ b = _____ Reason = _____

QUESTION 5	MIXED (11 marks)	ANSWERS
1.	$\frac{5d-2}{3} + \frac{2d-5}{7}$	
2.	$(2a+1)(2a-1) - 3a^2 + 3$	
3.	The price of an antique watch was marked up by 5% and sold for \$441. Find the cost of the watch before the mark up was applied.	
4.	 A pencil case in the shape of a rectangular prism has dimensions 12cm, 9cm and 8cm. Find the length of the longest pencil that will fit completely within the pencil case.	
5.	ABCD is a rectangle with $\angle EBC = 59°$. Find $\angle ECB$ and $\angle ABE$ (no reasons required). 	$\angle ECB$= _____ $\angle ABE$= _____
6.	If $f(x) = 3x^2 + 1$, find $f(-3)$	

Name: ..... Maths Class: .....

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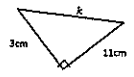
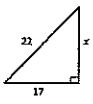
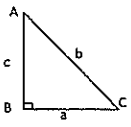
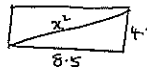
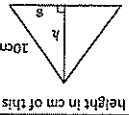
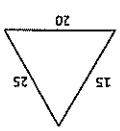
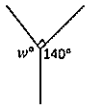
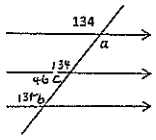
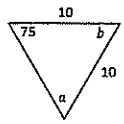
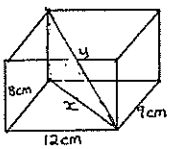
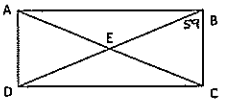
Question 2 Percentages	/15	/2
Question 3 Algebra	/15	/5
Question 4 Geometry	/15	/2
TOTAL		/70

QUESTION 1 PYTHAGORAS THEOREM (14 marks)		ANSWERS
1.	Find the value of k correct to 2 decimal places 	$k^2 = 11^2 + 3^2$ $k^2 = 130$
2.	Find the value of x leaving your answer in exact form 	$x^2 = 22^2 - 17^2$ $x^2 = 195$
3.	Is 5, 12, 14 a Pythagorean Triad? $14^2 = 12^2 + 5^2$ $196 \neq 169$	NO
4.	Which statements are true for this triangle (more than 1 is possible)?  A. $AB^2 = BC^2 + CA^2$ B. $AC^2 = BC^2 + AB^2$ C. $a^2 = b^2 + c^2$ D. $b^2 = c^2 + a^2$ E. $c^2 = a^2 + b^2$	B, D
5.	Find the length of the diagonal in a rectangle with length 8.5cm and width 4.7cm. Answer correct to 1 decimal place. 	$x^2 = 8.5^2 + 4.7^2$ $x^2 = 94.34$ $x = 9.7$

QUESTION 2 PERCENTAGES (15 marks)		ANSWERS
1.	Convert $3\frac{3}{5}$% to a fraction in simplest form	$\frac{9}{250}$
2.	Arrange these numbers in ascending order $\frac{9}{20}$, 42.6%, $\frac{2}{5}$, 0.46 0.425 0.426 0.4 0.46	$\frac{2}{5}$, 42.6%, $\frac{9}{20}$, 0.46
3.	Find 27.3% of 4L	$27.3\% \times 4L$ 1.092L
4.	What percentage is 219cm of 6m?	$\frac{219}{600} \times 100$ 36.5%
5.	Decrease 240t by 28%	$72\% \times 240t$ 172.8t
6.	Find the number if 15% of the number is 114 15% is 114 10% $\frac{114}{15}$ 100% $\frac{114}{15} \times 100$	760
7.	The cost of a coffee table was marked up from $160 to $184. Find the percentage mark up.	$\frac{24}{160} \times 100$ 15%
6.	Find the height in cm of this isosceles triangle 	$h^2 = 10^2 - 8^2$ $h^2 = 100 - 64$ $h^2 = 36$ $h = 6cm$
7.	Mary walks due west away from school at a speed of 3km per hour. Her friend Margaret walks due north from the school at a speed of 4km per hour. How far apart are the girls after 90 minutes? 	$x^2 = 6^2 + 4.5^2$ $x^2 = 56.25$ $x = 7.5km$
8.	The triangle below is NOT drawn to scale. Is it right-angled? Give reasons for your answer 	$25^2 = 15^2 + 20^2$ $625 = 625.$ Yes Pyth. Theorem applies $25^2 = 15^2 + 20^2$

QUESTION 4	GEOMETRY (15 marks)	ANSWERS
1.	The supplement of 75° is	105
2.	Find the value of the pronumerals giving reasons	
	a) 	x = 123 Reason = Vertically opposite angles equal
	b) 	w = 130 Reason = angles at a point add to 360°.
	c) 	a = 134 Reason = Vertically opp angles equal b = 134 Reason = corresponding angles equal in parallel lines c = 46 Reason = co-interior angles supplementary in parallel lines
	d) 	a = 75° Reason = equal angles of isosceles triangle b = 30 Reason = angle sum of triangle

QUESTION 5	MIXED (11 marks)	ANSWERS
1.	$\frac{5d-2}{3} + \frac{2d-5}{7} = \frac{35d-14+6d-15}{21}$	$\frac{41d-29}{21}$
2.	$(2a+1)(2a-1) - 3a^2 + 3$ $4a^2 - 1 - 3a^2 + 3$	$a^2 + 2$
3.	The price of an antique watch was marked up by 5% and sold for \$441. Find the cost of the watch before the mark up was applied. $1.05x = 441.$ $x = 420$	\$420
4.	 A pencil case in the shape of a rectangular prism has dimensions 12cm, 9cm and 8cm. Find the length of the longest pencil that will fit completely within the pencil case.	$x^2 = 9^2 + 12^2$ $x^2 = 225$ $x = 15.$ $y^2 = 225 + 64$ $y^2 = 289$ $y = 17cm$
5.	ABCD is a rectangle with $<EBC = 59°$. Find $<ECB$ and $<ABE$ (no reasons required). 	<ECB= 59 <ABE= 31
6.	If $f(x) = 3x^2 + 1$, find $f(-3)$ $f(-3) = 3(-3)^2 + 1$	28

8.	A salesman is paid a weekly wage of \$110 plus commission of 17% on his sales. Find his total pay for a week in which his sales totalled \$2300.	\$501 $= 110 + \frac{17}{100} \times 2300$
9.	At a children's party, 36% of the children present were boys. If there were 32 girls at the party, how many children were at the party?	50 36% boys 64% girls 32
10.	Find the simple interest earned on \$457 at $6\frac{1}{4}$% for 6 months.	\$14.28 $457 \times 6\frac{1}{4}\% \times \frac{6}{12}$
11.	Increase \$60 by 20% then decrease the result by 20%	\$57.60 120% × 60 = \$72 80% × 72 = 57.6

QUESTION 3	ALGEBRA (15 marks)	ANSWERS
1.	Simplify $5p - 3q - 5p - 3q$	$-6q$
2.	Simplify $30a^2b \div 6ab$	$5a$
3.	Simplify $8f + 42ef^2 \div 7ef$	$1+f$ $\frac{4+42ef}{7ef}$
4.	Expand and simplify a) $9(4x-7) + 3x$	$39x - 63$ $= 36x - 63 + 3x$
	b) $(3x-2)^2$	$9x^2 - 12x + 4$
5.	Simplify a) $\frac{x}{5} + \frac{x}{3}$	$\frac{8x}{15}$ $\frac{3x+5x}{15}$
	b) $\frac{ab}{3ac} \div \frac{ac}{55}$	$\frac{11b}{6c^2}$ $\frac{ab}{3\cancel{6}c} \times \frac{\cancel{55}^{11}}{\cancel{a}c}$ 6
	c) $3y^5 \times 7y^{11}$	$21y^{16}$
	d) $(3x^4)^3$	$27x^{12}$
	e) $3^8 \div 3^2$	3^6
6.	Factorise a) $5ab - 20ac$	a) $5a(b-4c)$
	b) $-8a^2 + 12a$	b) $-4a(2a-3)$