# *St Aloysius' College*
# *Year 9 5.3 Term I Mathematics Assessment*
# *18th March 2016*

**Time allowed:** 40 minutes

**Total Marks:** 44

NAME: SOLUTIONS.

TEACHER: **GON** **KAU** **FDE** **MLM**

**Instructions:**

- Approved calculators may be used.
- All necessary working is to be shown for Part C.
- Marks may be deducted for careless or poorly arranged work.

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**PART A:** **Multiple Choice Questions**: **5 marks**

For questions 1 – 5, circle the correct answer, A, B, C or D.

**1.** Which of these decimals could be rounded to 34.71?

(A) 34.715 (B) 34.707 (C) 34.7 (D) 34.7039

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**2.** Expand and simplify $3(5-2p) - 2(4p-3)$

(A) $21-14p$ (B) $9-14p$ (C) $14p-21$ (D) $12-10p$

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**3.** Tobias invests \$4,500 in an account paying 5.2% p.a. simple interest over a period of 3 years.

What amount would Richard be able to withdraw from his account at the end of the 3 years?

(A) \$156 (B) \$702 (C) \$4,656 (D) \$5,202

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**4.** Luke earns \$3,998.40 per month. How much is this per week?

(A) \$888.53 (B) \$919.52 (C) \$922.70 (D) \$999.60

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**5.** Solve $3-2x \leq 11$

(A) $x \leq -7$ (B) $x \geq -7$ (C) $x \leq -4$ (D) $x \geq -4$

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## PART B:

***Short Answer Questions:*** 10 questions. All questions are worth one mark. **10 marks**

Give your answer only in the right-hand column.

Working out may be shown in the left-hand column.

| | **Answer** |
|---|---|
| **1.** Round off 0.025376 to 3 significant figures. | 0.0254 |
| **2.** Solve for $m$: $4m - 17 = 45$<br>$4m = 62$ | 15.5 |
| **3.** A digital camera was purchased for \$423.50, after a GST of 10% was added to the original price. How much was the GST paid?<br>$110\% = \$423.50$<br>$1\% = \$3.85$ | \$38.50 |
| **4.** James bought an item for \$680, and later sold it for \$986. What was his percentage profit?<br>$\frac{306}{680} \times 100$ | 45% |
| **5.** Simplify: $\frac{32a^7b^4}{40a^2b^6}$ = | $\frac{4a^5}{5b^2}$ |
| **6.** If 5 bottles of soft drink cost \$C, write an algebraic expression for the cost of $m$ bottles of soft drink. | $\frac{\$Cm}{5}$ |
| **7.** The population of a country town is decreasing at an annual rate of 6%. If its current population is 36 000, what will its population be in 10 years time? Give answer to the nearest whole number.<br>$A = 36000(1-0.06^{10})$ | \$19,390 |

**8.** Using the tax table below, determine the tax payable on a taxable income of $93,000.

| Taxable Income | Tax Payable |
|---|---|
| $0 – $18,200 | NIL |
| $18,201 – $37,000 | 19 cents for each $1 over $18,200 |
| $37,001 – $80,000 | $3,572 plus 32 cents for each $1 over $37,000 |
| $80,001 – $180,000 | $17,547 plus 37 cents for each $1 over $80,000 |
| $180,001 and over | $54,547 plus 45 cents for each $1 over $180,000 |

Tax payable $= \{(93,000 - 80,000) \times 0.37\} + 17547$

$22357

**9.** The time taken for one complete swing of a pendulum is given by $T = \frac{1}{5}\sqrt{L}$

where $L$ is the length of the pendulum, in cm, and $T$ is the time in seconds.
If the time of the swing is 2 seconds, find the length of the pendulum, $L$ in cm.

$2 = \frac{1}{5}\sqrt{L}$

$10 = \sqrt{L}$

$L = 100$

100 cm

**10.** Dominic, a car salesman works on a commission basis.
He is given a retainer of $400 per week, plus 2% of the selling price of a car.
If in one week he sells a car for $48 000, what is his gross wage for that week?

Wage $= 400 + (0.02 \times 48,000)$

$1360

## PART C:

NAME: SOLUTIONS

TEACHER: **GON** **KAU** **FDE** **MLM**

### *Free Response Questions:*

All necessary working is to be shown for Part C. **29 marks**

**1.** Connor's gross income last year was \$72,000. He had allowable tax deductions of \$5,000. Connor paid 1.5% of his taxable income for the Medicare Levy.

How much was Connor's Medicare Levy?

$TI = 72{,}000 - 5000$

$= 67{,}000$

$ML = \frac{1.5}{100} \times 67000$

$= \$1005$ **1**

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**2.** Solve for $p$: $18 - \frac{4p}{5} = 32$

$-\frac{4p}{5} = 14$

$-4p = 70$

$p = -\frac{70}{4}$ or $-17.5$ **2**

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**3.** Josh earned \$1440 in a week.
He worked 28 hours during normal working hours, Monday to Friday.
He also worked 6 hours on Saturday at time-and-a-half, plus 4 hours on Sunday at double-time. Calculate his hourly rate of pay.

Time worked $= 28 + (6 \times 1.5) + (4 \times 2)$

$= 45h$ **2**

Rate pay $= \frac{1440}{45} = \$32/h$.

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**4.** Tomas invests \$24 000 and earns \$9 000 simple interest in 6 years.
Calculate the simple interest rate, giving answer to two decimal places.

$I = PRN$

$9000 = 24000 \times R \times 6$

$R = 6.25\%$

**2**

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**5.** Solve: $15 - 4(2x - 7) = 19 - 5x$

$15 - 8x + 28 = 19 - 5x$

$43 - 8x = 19 - 5x$

$24 = 3x$

$x = 8$

**2**

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**6.** Josh invests \$38 000 for 6 years, at 9% p.a. interest, the amount compounded monthly.
What is the balance in the account at the end of 6 years?

$n = 6 \times 12 = 72$

$r = \frac{0.09}{12} = 0.0075$

$A = 38000 \times 1.0075^{6 \times 12}$

$= \$65077$

**2**

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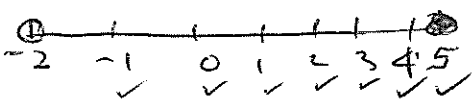
**7.** How many ***integers*** satisfy BOTH of the given inequations?

$11 - 3x \geq -4$ and $4x - 15 > -23$

$-3x \geq -15$ $\qquad$ $4x > -8$

$x \leq 5$ $\qquad$ $x > -2$




$\therefore 7$

**3**

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**8.** When Nicholas used the tax table shown below, to calculate his income tax payable.

| Taxable Income | Tax Payable |
|---|---|
| \$0 – \$6 000 | NIL |
| \$6 001 – \$30 000 | NIL plus 15 cents for each \$1 over \$6 000 |
| \$30 001 – \$75 000 | \$3 600 plus 30 cents for each \$1 over \$30 000 |
| \$75 001 – \$150 000 | $A$ plus 40 cents for each \$1 over \$75 000 |
| \$150 001 and over | \$47 100 plus 45 cents for each \$1 over \$150 000 |

(i) After Nicholas did all his calculations, he calculated his tax payable to be \$12 225. What was his taxable income?

$12225 = \{(x - 30{,}000) \times 0.30\} + 3600$

$8625 = 0.3x - 9000$

$17625 = 0.3x$

$x = \$58750$ $\therefore TI = \$58750$.

**2**

(ii) From the Tax Scale table above, calculate the value of $A$.

$A = \{(75{,}000 - 30{,}000) \times 0.3\} + 3600$

$= \$13500 + 3600$

$= \$17{,}100$.

**1**

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**9.** A formula is given by $p = \dfrac{m-n}{mn-1}$. Make $m$ the subject.

$p(mn-1) = m-n$

$pmn - p = m - n$

$pmn - m = p - n$

$m(pn-1) = p-n$

$m = \dfrac{p-n}{pn+1}$

**2**

**10.** A certain amount of money is invested at 9% p.a. interest, with the interest compounded yearly. How many years will it take for the original amount to grow to three times its original amount? Give answer to the nearest whole year.

$3P = P(1.09)^n$

$3 = 1.09^n$

**2**

$1.09^{12} = 2.81$

$1.09^{13} = 3.06$

$\therefore$ 13 years

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**11.** Using the elimination method, solve the two equations below simultaneously, obtaining the values of $x$ and $y$.

$5x - 2y = 8$ — ①
$7x - 8y = -20$ — ②

① × 4

$20x - 8y = 32$ — ③
$7x - 8y = -20$ — ②

③ − ②

**2**

$13x = 52$

$x = 4$

$\therefore$ Sub $x = 4$ into ①

$5(4) - 2y = 8$
$20 - 2y = 8$
$-2y = -12$
$y = 6$.

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**12.** The sum of three consecutive odd numbers is 23 more than the sum of the even numbers that lie between them.

(i) By using the pronumeral $x$, form an equation showing the above relationship.

$2x + 1 + 2x + 3 + 2x + 5 = 2x + 2 + 2x + 4 + 23$ 1

(ii) Solve the equation from part (i), to find the three consecutive numbers.

$2x = 20$

$x = 10$

2

$\therefore$ Numbers are 21, 23 and 25.

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**13.** At a local fruit shop, apples are sold at 24c each, and pears are sold at 28c each. Christopher bought 8 more pears than apples, and paid the fruiterer $3.80. How many apples and pears did Christopher purchase?

$a = 0.24$

$p = 0.28$

Let $x$ = no of apples.

$a + p = 3.80$

$0.24x + 8 + x(0.28) = 3.80$

3

$0.24x + 2.24 + 0.28x = 3.80$

$0.52x = 1.56$

$x = 3$

$\therefore$ 3 apples, 11 pears.

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**End of Assessment**