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1. Arrange the following numbers in ascending order:

$-0.37, -0.373, -0.3\dot{7}, -\frac{16}{42}, -0.\dot{3}7\dot{3}$

Answer: _____ [2]

2. Evaluate without using a calculator (show all your workings clearly).

(a) $(-2)^2 \times (3-5) \div [2-(3+2)]$

(b) $\left(-\frac{1}{3}+\frac{1}{6}\right) \div \left[\left(-\frac{2}{3}\right) \times \frac{21}{3}\right]$

Answer: (a) _____ [3]

(b) _____ [3]

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3. Without using the calculator, estimate, correcting your answer to 1 significant figures, the value of: $\frac{\sqrt{37.997} \times 24.9068}{49.5346}$

Answer: _____ [2]

4. Factorise completely:
   (a) $20s - 5st + 10su$
   (b) $4st + 8t - 6 - 3s$

Answer: (a) _____ [1]

(b) _____ [2]

5. The average History marks for 1E5 out of 50 is 34.0198. Express this average mark correct to:
   (a) 2 decimal places
   (b) 2 significant figures
   (c) the nearest integer

Answer: (a) _____ [1]

(b) _____ [1]

(c) _____ [1]

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6. Given that $a = 2$ and $b = -7$, without using a calculator, find the value of $\dfrac{-4(a+2b)}{2a-b}$.

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Answer: _____ [3]

7. Simplify the following expressions.

(a) $-4(2t-5)-[5s-9(s+t)]$,

(b) $-\dfrac{5-t}{3}+\dfrac{2t+3}{2}$,

(c) $2-\dfrac{x-2}{2}+\dfrac{3(x+3)}{4}$.

Answer: (a) _____ [2]

(b) _____ [3]

(c) _____ [3]

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8. Solve the equation $\frac{5(3s+2)}{3} = 4s$.

Answer: _____ [3]

9. Compute the following using algebraic manipulation without the use of calculator.
   (a) $327 \times 41 + 327 \times 59$
   (b) $531 \times 136 - 531 \times 36$

Answer: (a) _____ [2]

(b) _____ [2]

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10. The dimensions of a rectangle are $(3^5 \times 7)$ cm by $\left(3 \times 5^4 \times 7\right)$ cm.
    (a) Find the area of the rectangle. Express your answer in prime factorization form.
    (b) A square has the same area as the rectangle. Find the length of a side of the square.

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Answer: (a) _____ cm^2 [2]

(b) _____ cm [2]

11. (a) Express 294 and 390 as products of prime factors using index notation. Hence find the highest common factor of the numbers.
    (b) Write down the smallest value of n for which $294n$ is a square number.

Answer:(a) _____ [2]

(b) _____ [1]

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12. Miss Choo has a certain sum of money to buy stationeries. She can buy x pen at \$1.30 each and have \$0.80 left. Alternatively, she can buy $(x+4)$ pencils at \$0.90 each and have \$0.20 left.
(a) Form an equation using x and solve it.
(b) How much money does Miss Choo have to buy stationeries?
(c) If Miss Choo buys 4 pens and uses the rest to buy pencils,
(i) How many pencils can she buy?
(ii) How much money does she have left?

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Answer: (a) $x =$ _____ [3]

(b) \$ _____ [2]

(c) (i) _____ pencils [2]

(ii) \$ _____ [2]

End Of Paper

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1. (a) Find the LCM of 125 and 260.
   (b) Find the cube root of the LCM in (a), leave your answer correct to 3 significant figures.

Answer (a) _____[1]

(b) _____[1]

2. Express the following numbers in index notation.
   (a) 2205
   (b) $(2^3 \times 3^2 \times 3 \div 2^2)^3$

Answer (a)_____ [1]

(b)_____ [2]

3. Evaluate the following and give the answers correct to 3 decimal places.
   (a) $\dfrac{\sqrt{19^3 - 4.8^2}}{1 + 3.02^2}$
   (b) $\dfrac{4\frac{5}{7} + 3\frac{1}{2} \times \left(-\frac{4}{5}\right)}{\sqrt[3]{25.06}}$

Answer (a)_____ [2]

(b)_____ [2]

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4. When $a=\frac{3}{4}$, $b=-\frac{1}{3}$ and $c=5$, find the values of each of the following and leave your answers correct to 3 significant figures.

(a) $\frac{12ac-b^2}{ab-4}$

(b) $\frac{4b}{a^2c}-\frac{3a}{c}$

Answer (a) _____[2]

(b) _____[2]

5. Simplify the following.

(a) $5(4x-y)-2(3x-6y)$

(b) $\frac{2x+5}{3}+\frac{3y-1}{2}-\frac{x-2y}{6}$

Answer (a) _____[2]

(b) _____[3]

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6. $4896 is divided equally among some seniors in an old folks' home. If there were 5 seniors fewer, each old folk would have $48. Solve using algebraic equation, the number of old folks in the home.

Answer _____ [2]

7. Solve the equation

(a) $\frac{2x+1}{x-3} = 2\frac{1}{3}$

(b) $\frac{2y}{5} - \frac{7y}{6} = -\frac{y}{10} + \frac{2}{3}$

Answer(a) _____ [2]

(b) _____ [2]

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8. The area of a square frame is $30625 cm^2$.
   (a) Express the area in prime factorization form.
   (b) Hence, find the length of the side of the square frame.

Answer (a)_____[2]

(b)_____[2]

9. The bell of St. Andrew School goes off every 35 minutes while the bell of St. Nicholas School goes off every 40 minutes. Students of both schools must arrive in school by 0730, when the first bell goes off.
   (a) When is the next time that the bell of both schools go off at the same time, after 07 30?
   (b) If St. Andrew School has 11 periods including recess on Monday and St. Nicholas School has 10 periods including recess, students of which school are dismissed earlier on Monday? How much earlier?

Answer (a) _____[3]

(b) _____
By _____ min
[3]

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10. Johnny spent $\frac{2}{5}$ of his monthly salary on housing installment, $\frac{1}{3}$ on food, $\frac{1}{4}$ of the remaining on transportation and he saved the rest.

(a) What fraction of his salary did he spend on transportation?

(b) If he earns $ 6600 per month, how much did he save?

(c) What percentage of his income does he save?

Answer (a) _____[2]

(b)_____[2]

(c)_____[1]

11. In a particular shopping centre, the ground level is indicated by 0 and the basement levels are indicated by –1, –2, …

(a) Mr. Tan parked his car at Level –2 and took the lift to the highest level. If the lift travelled up by 8 levels, find the highest level of the shopping centre.

(b) Suppose Mr. Tan parked his car at the lowest level. He was at Level 3 and wanted to get something from his car, he had to travel down by 6 levels, how many basement levels did the shopping centre have?

(c) How many levels does the shopping centre have altogether?

Answer (a)_____[2]

(b)_____[2]

(c)_____[2]

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12. The Lim family pays $\$x$ monthly subscription for their residential phone line. In addition, usage is charged at one cent per minute. Let M be the Lim family's monthly phone bill and n be the number of minutes of usage.
    (a) Write down a formula relating M, x and n.
    (b) If the Lim family's phone bill for the month of January is \$9.15, find the monthly subscription fee given that the usage is 1 hour 5 min.
    (c) The Lim family's phone bill for the month of February is \$9.85. Given that the monthly subscription fee remains the same, find the amount of usage for February, giving your answer in hours and minutes.

Answer (a)_____[1]

(b)_____[2]

(c)_____[2]

The End

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SEC 1EXP P2 MYE
Answer Scheme

Qn	Part	Solutions	Marks
1	a	$5 \mid 125,\ 260$ $\quad\ \ 25,\ 52$ LCM$=5\times25\times52=6500$	A1
	b	$\sqrt[3]{6500}=18.6625$ ≈ 18.7	A1
2	a	$5 \mid 2205$ $3 \mid 441$ $3 \mid 147$ $7 \mid 49$ $\quad\ \ 7$ $2205=3^2\times5\times7^2$	A1
	b	$\left(\frac{2^3\times3^2\times3}{2^2}\right)^3=(2\times3^3)^3$	M1
		$=2^3\times3^9$	A1
3	a	8.1696 [*A*1]$\approx$8.17	A1, A1
	b	0.65415 [*A*1]$\approx$0.654 Wrong Answesr but gave two answers and know how to round off to 3 s.f, still award [B1] mark. Correct Answers w/o giving calculator's answer, still award 2 marks.	A1, A1
4	a	$\frac{12(\frac{3}{4})(5)-(-\frac{1}{3})^2}{(\frac{3}{4})(-\frac{1}{3})-4}$ [*M*1] *OR* $\frac{45-\frac{1}{9}}{-\frac{1}{4}-4}\approx-10.6$	M1, A1
	b	$\frac{4(-\frac{1}{3})}{(\frac{3}{4})^2(5)}-\frac{3(\frac{3}{4})}{5}$ [*M*1] *OR* $\frac{-\frac{4}{3}}{\frac{45}{16}}-\frac{\frac{9}{4}}{5}\approx-0.924$ Without bracket, no mark. But will award M1 if second step is given.	M1, A1
5	a	$20x-5y-6x+12y$ $=14x+7y$	M1 A1

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5	b	$\frac{2(2x+5)}{6}+\frac{3(3y-1)}{6}-\frac{x-2y}{6}$ $=\frac{4x+10+9y-3-x+2y}{6}$ $=\frac{3x+11y+7}{6}$	M1 M1 A1
6		$(x-5)\times 48=4896$ $48x-240=4896$ $48x=5136$ $x=107$ Only accept using algebraic eqn method	M1 A1
7	a	$3(2x+1)=7(x-3)$ $x=24$	M1 A1
	b	$\frac{12y}{30}-\frac{35y}{30}+\frac{3y}{30}=\frac{2}{3}$ $\frac{-20}{30}y=\frac{2}{3}$ $y=-1$	M1 A1
8	a	5 | 30625 5 | 6125 5 | 1225 5 | 245 7 | 49 7 $30625=5^4\times 7^2$	M1 A1
	b	$\sqrt{30625}=\sqrt{5^4\times 7^2}$ $=\sqrt{(5^2\times 7)^2}$ $=175$ Hence find length, do not accept answer in index notation.	M1 A1

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9	a	$\begin{array}{r\|l} 5 & 35,\ 40 \\ \hline & 7,\ 8 \end{array}$ LCM = 280 min = 4 h 40 min Time = 0740 + 4 h 40 min = 1210	M1 A1 A1
	b	St. Andrew : $11\times35=385$ $=6h\ 25\text{min}$ St. Nicholas: $10\times40=400$ $=6\ h\ 40\ \text{min}$ St Andrew school dismissed earlier. $6h\ 40\text{min}-6h\ 25\text{min}=15\text{min}$	M1 A1 A1
10	a	$\left(1-\frac{2}{5}-\frac{1}{3}\right)\times\frac{1}{4}[M1]=\frac{1}{15}$	M1, A1
	b	$\$6600\times\left(1-\frac{2}{5}-\frac{1}{3}-\frac{1}{15}\right)[M1]=\$1320$	M1, A1
	c	$\frac{\$1320}{\$6600}\times100\%=20\%$	A1
11	a	$-2+8=6$ Accept using number line	M1, A1
	b	$3-6=-3$ Accept using number line	M1, A1
	c	$-3,-2,-1,\ 0,\ 1,\ 2,\ 3,\ 4,\ 5,\ 6$ Total 10 levels Accept using number line	M1, A1
12	a	$M=x+0.01n$ (Or $M=100x+n$)	A1
	b	1 h 5 min = 65 min $9.15=x+0.01(65)$ = \$8.50	M1 A1
	c	$9.85=8.50+0.01n$ [M1] n = 135 min = 2 h15 min	M1 A1

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1. Arrange the following numbers in ascending order:

$-0.37, -0.373, -0.3\dot{7}, -\frac{16}{42}, -0.\dot{3}\dot{7}\dot{3}$

$= -0.37, -0.373, -0.377777, -0.38095, -0.373373373$

B2(1 mark awarded if 1 number in wrong placing. 0 marks if 2 or more numbers in wrong placing, 1 mark awarded if they wrote the expanded version of the number instead of the given number)

Answer: $-\frac{16}{42}, -0.3\dot{7}, -0.\dot{3}7\dot{3}, -0.373, -0.37$ [2]

2. Evaluate without using a calculator (show all your workings clearly).

(a) $(-2)^2 \times (3-5) \div [2-(3+2)]$

$= 4 \times (-2) \div [2-5] ---M1$

$= (-8) \div (-3) ---M1$

$= \frac{8}{3} = 2\frac{2}{3}$

(b) $\left(-\frac{1}{3}+\frac{1}{6}\right) \div \left|\left(-\frac{2}{3}\right) \times \frac{21}{3}\right|$

$= \left(-\frac{2}{6}+\frac{1}{6}\right) \div \left|-\frac{14}{3}\right| --M1$

$= \left(-\frac{1}{6}\right) \times \left(-\frac{3}{14}\right) ---M1$

$= \frac{1}{28}$

Answer: (a) $\frac{8}{3}$ [3]

(b) $\frac{1}{28}$ [3]

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3. Without using the calculator, estimate, correcting your answer to 1 significant figures, the value of:

$$\frac{\sqrt{37.997 \times 24.9068}}{49.5346}$$

$$= \frac{\sqrt{36} \times 25}{50} \text{---} M1$$

$$= \frac{6 \times 25}{50} = 3$$

Answer: 3 [2]

4. Factorise completely:
   (a) $20s - 5st + 10su$
   (b) $4st + 8t - 6 - 3s$

(a) $20s - 5st + 10su = 5s(4 - t + 2u) \text{--} A1$

(b) $4st + 8t - 6 - 3s$

$= 4t(s+2) - 3(2+s) \text{---} M1$

$= (s+2)(4t-3) \text{---} A1$

Answer: (a) _____ [1]

(b) _____ [2]

5. The average marks for 1E5 out of 50 for History is 34.0198. Express this average mark correct to:
   (a) 2 decimal places
   (b) 2 significant figures
   (c) the nearest integer

Answer: (a) 34.02 [1]

(b) 34 [1]

(c) 34 [1]

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6. Given that $a = 2$ and $b = -7$, without using a calculator, find the value of $\dfrac{-4(a+2b)}{2a-b}$.

$$= \frac{-4(2+2(-7))}{2(2)-(-7)}$$

$$= \frac{-4(2-14)}{4+7}$$

$$= \frac{-4(-12)---M1}{11---M1}$$

$$= \frac{28}{11} = 2\frac{6}{11}$$

Answer: $2\frac{6}{11}$ [3]

7. Simplify the following expressions,

(a) $-4(2t-5)-[5s-9(s+t)]$,

(b) $-\dfrac{5-t}{3}+\dfrac{2t+3}{2}$,

(c) $2-\dfrac{x-2}{2}+\dfrac{3(x+3)}{4}$.

(a)
$$-4(2t-5)-[5s-9(s+t)]$$
$$= -8t+20-[5s-9s-9t]$$
$$= -8t+20-[-4s-9t]---M1$$
$$= -8t+20+4s+9t$$
$$= t+4s+20---A1$$

(b)
$$-\frac{5-t}{3}+\frac{2t+3}{2}$$
$$= \frac{-2(5-t)+3(2t+3)}{6}---M1$$
$$= \frac{-10+2t+6t+9}{6}---M1$$
$$= \frac{-1+8t}{6}---A1$$

(c)
$$2-\frac{x-2}{2}+\frac{3(x+3)}{4}$$
$$= \frac{8-2(x-2)+3(x+3)}{4}---M1$$
$$= \frac{8-2x+4+3x+9}{4}---M1$$
$$= \frac{21+x}{4}---A1$$

Answer: (a) _____ [2]

(b) _____ [3]

(c) _____ [3]

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8. Solve the equation $\frac{5(3s+2)}{3} = 4s$.

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$5(3s+2) = 12s$ ---$M1$

$15s + 30 = 12s$

$3s = -30$ ---$M1$

$s = -10$ ---$A1$

Answer: s = _____ [3]

9. Compute the following using algebraic manipulation without the use of calculator.
   (a) $327 \times 41 + 327 \times 59$
   (b) $531 \times 136 - 531 \times 36$

(a) $327 \times 41 + 327 \times 59$

$= 327(41+59)$ ---$M1$

$= 327(100)$

$= 32700$ ---$A1$

(b) $531 \times 136 - 531 \times 36$

$= 531(136-36)$ ---$M1$

$= 531(100)$

$= 53100$ --$A1$

Other methods not accepted and no answer mark to be given.

Answer: (a) [2]

(b) _____ [2]

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10. The dimensions of a rectangle are $(3^5 \times 7)$ cm by $(3 \times 5^4 \times 7)$ cm.
    (a) Find the area of the rectangle. Express your answer in prime factorization form.
    (b) A square has the same area as the rectangle. Find the length of a side of the square.

(a) $(3^5 \times 7) \times (3 \times 5^4 \times 7) = 3^6 \times 5^4 \times 7^2$---M1, A1

$\sqrt{3^6 \times 5^4 \times 7^2}$ ---*M*1

(b) $= 3^3 \times 5^2 \times 7$

$= 4725$ --*A*1

Answer: (a) $3^6 \times 5^4 \times 7^2$ [2]

(b) 4725 [2]

11. (a) Express 294 and 390 as products of prime factors using index notation. Hence find the highest common factor of the numbers.
    (b) Write down the smallest value of n for which $294n$ is a square number.

$294 = 2 \times 3 \times 7^2$

$390 = 2 \times 3 \times 5 \times 13$--- for both, M1

HCF = 6 -----A1

b) 6

Answer:(a) 6 [2]

(b) 6 [1]

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12. Miss Choo has a certain sum of money to buy stationeries. She can buy x pen at \$1.30 each and have \$0.80 left. Alternatively, she can buy $(x+4)$ pencils at \$0.90 each and have \$0.20 left.
(a) Form an equation using x and solve it.
(b) How much money does Miss Choo have to buy stationeries?
(c) If Miss Choo buys 4 pens and uses the rest to buy pencils,
(i) How many pencils can she buy?
(ii) How much money does she have left?

(a)

$1.3x + 0.8 = 0.9(x+4) + 0.2 ---M1$

$1.3x + 0.8 = 0.9x + 3.6 + 0.2 ---M1$

$0.4x = 3$

$x = 7.5 ---A1$

(b)

$1.3(7.5) + 0.8 = \$10.55$---M1,A1

(c)

(i) $\frac{10.55 - 4(1.3)}{0.9} --M1$

$= 5.944 \approx 5 pencils ---A1$

(ii) 10.55-4(1.3)-5(0.9) ----M1

= \$0.85 ---A1

Answer: (a) X=7.5 [3]

(b) \$10.55 [2]

(c) (i) 5 pencils [2]

(ii) \$0.85 [2]

End Of Paper

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