HCF and LCM - Worksheet

Skill

Group A - Highest common factor

Calculate the highest common factor for the following set of numbers:

1) $12,\ 20$

2) $27,\ 18$

3) $30,\ 105$

4) $63,\ 147$

5) $88,\ 40,\ 56$

6) $308,\ 126$

7) $175,\ 385$

8) $110,\ 286$

9) $273,\ 182$

10) $2079,\ 1071$

11) $506,\ 957$

12) $832,\ 912$

Group B - Lowest common multiple

Calculate the lowest common multiple for the following set of numbers:

1) $2,\ 3$

2) $3,\ 5,\ 7$

3) $4,\ 12$

4) $27,\ 9$

5) $54,\ 36$

6) $24,\ 40,\ 72$

7) $35,\ 45$

8) $48,\ 72$

9) $420,\ 49$

10) $176,\ 40$

11) $286,\ 715$

12) $507,\ 273$

Group C - Calculating original value

Use the information provided to calculate the other original value:

1) $a = 12$,
$\text{HCF} = 2, \text{LCM} = 60$

2) $a = 15$,
$\text{HCF} = 3, \text{LCM} = 60$

3) $a = 24$,
$\text{HCF} = 8, \text{LCM} = 48$

4) $a = 18$,
$\text{HCF} = 9, \text{LCM} = 54$

5) $a = 72$,
$\text{HCF} = 18, \text{LCM} = 216$

6) $a = 6$,
$\text{HCF} = 6, \text{LCM} = 78$

7) $a = 100$,
$\text{HCF} = 25, \text{LCM} = 700$

8) $a = 64$,
$\text{HCF} = 8, \text{LCM} = 320$

9) $a = 225$,
$\text{HCF} = 45, \text{LCM} = 450$

10) $a = 240$,
$\text{HCF} = 30, \text{LCM} = 1200$

11) $a = 847$,
$\text{HCF} = 121, \text{LCM} = 3388$

12) $a = 231$,
$\text{HCF} = 33, \text{LCM} = 3003$

HCF and LCM - Worksheet

Applied

1) **(a)** Two planks of wood are $200cm$ and $240cm$ in length. Each plank of wood is to be cut into the same length pieces. Calculate the maximum length of each piece.

(b) 3 people are planting trees. Alan plants a tree every 10 minutes. Ben plants a tree every 12 minutes, and Carol plants a tree every 8 minutes. If they each planted trees continuously, how long would it take for them to all plant a tree at the same time?

2) **(a)** Two buses leave the depot at 10:30am. Bus A takes 35 minutes to arrive back at the depot, Bus B takes 40 minutes to arrive back at the depot. When are they both back at the depot at the same time?

(b) Bus A takes on an adult passenger on average every 60 seconds, and a child passenger every 72 seconds. If an adult and a child get onto Bus A at 2:24pm, is Bus B at the depot the next time an adult and a child get onto Bus A together?

3) **(a)** Two rectangular cakes are being cut into slices. The first cake is $36cm$ long. The second cake is $40cm$ long. If every slice is to be the same size, what is the greatest possible width of each slice?

(b) How many slices would there be in total?

4) **(a)** A Science technician is trying to sort equipment into groups. Each group is required to have the maximum amount of each piece of equipment possible and the same amount of equipment in each group. There are 360 $250ml$ glasses, 200 conical flasks and 420 pipettes. How many groups of equipment can the Technician make?

(b) A cafe receives a delivery of ice cream in large containers. The container of strawberry ice cream weighs $1.6kg$, vanilla ice cream weighs $2.4kg$ and chocolate ice cream weighs $2kg$. Each dessert must have the same number of scoops of each flavour with no wastage. What is the maximum number of scoops of each flavour ice cream possible in the dessert?

HCF and LCM - Exam Questions

1) **(a)** Circle the highest common factor of 6, 16 and 20.
20, 6, 2, 1, 240 ..... **(1)**

(b) Circle the lowest common multiple of 4, 12 and 18.
2, 6, 18, 36, 864 ..... **(1)**

(2 marks)

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2) **(a)** Write 72 as a product of prime factors. Write your answer in index form. ..... **(3)**

(b) Given that $96 = 2^5 \times 3$, calculate the highest common factor of 72 and 96. ..... **(2)**

(c) Calculate the lowest common multiple of 72 and 96. ..... **(2)**

(7 marks)

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3) **(a)** Calculate the lowest common multiple of $24a^2b^3$ and $16ab^2$. ..... **(3)**

(b) The Contented Sole fish and chip shop need to order their stock for the next week. They can buy fresh fish in boxes of 30, and bags of potatoes, that would each be shared into 50 portions of chips. What is the minimum number of boxes of fish and bags of potatoes, so that the shop can sell 'fish and chips' with no portions left over? ..... **(3)**

(6 marks)

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4) **(a)** Given that $54x = 2 \times 3^3 \times x$, calculate the highest common factor of $90x^2$ and $54x$. ..... **(2)**

(b) Hence simplify $\frac{54x}{90x^2}$. ..... **(2)**

(4 marks)

HCF and LCM - Answers

	Question	Answer
Group A	Skill Questions	
	Calculate the highest common factor for the following set of numbers: **1)** 12, 20 **2)** 27, 18 **3)** 30, 105 **4)** 63, 147 **5)** 88, 40, 56 **6)** 308, 126 **7)** 175, 385 **8)** 110, 286 **9)** 273, 182 **10)** 2079, 1071 **11)** 506, 957 **12)** 832, 912	**1)** 4 **2)** 9 **3)** 15 **4)** 21 **5)** 8 **6)** 14 **7)** 35 **8)** 22 **9)** 91 **10)** 63 **11)** 11 **12)** 16
Group B	Calculate the lowest common multiple for the following set of numbers: **1)** 2, 3 **2)** 3, 5, 7 **3)** 4, 12 **4)** 27, 9 **5)** 54, 36 **6)** 24, 40, 72 **7)** 35, 45 **8)** 48, 72 **9)** 420, 49 **10)** 176, 40 **11)** 286, 715 **12)** 507, 273	**1)** 6 **2)** 105 **3)** 12 **4)** 27 **5)** 108 **6)** 360 **7)** 315 **8)** 144 **9)** 2490 **10)** 880 **11)** 1430 **12)** 3549

HCF and LCM - Answers

	Question	Answer
Group C	Skill Questions	
	Use the information provided to calculate the other original value: **1)** $a = 12$, HCF $= 2$, LCM $= 60$ **2)** $a = 15$, HCF $= 3$, LCM $= 60$ **3)** $a = 24$, HCF $= 8$, LCM $= 48$ **4)** $a = 18$, HCF $= 9$, LCM $= 54$ **5)** $a = 72$, HCF $= 18$, LCM $= 216$ **6)** $a = 6$, HCF $= 6$, LCM $= 78$ **7)** $a = 100$, HCF $= 25$, LCM $= 700$ **8)** $a = 64$, HCF $= 8$, LCM $= 320$ **9)** $a = 225$, HCF $= 45$, LCM $= 450$ **10)** $a = 240$, HCF $= 30$, LCM $= 1200$ **11)** $a = 847$, HCF $= 121$, LCM $= 3388$ **12)** $a = 231$, HCF $= 33$, LCM $= 3003$	**1)** $b = 10$ **2)** $b = 12$ **3)** $b = 16$ **4)** $b = 27$ **5)** $b = 54$ **6)** $b = 78$ **7)** $b = 175$ **8)** $b = 40$ **9)** $b = 90$ **10)** $b = 150$ **11)** $b = 484$ **12)** $b = 429$

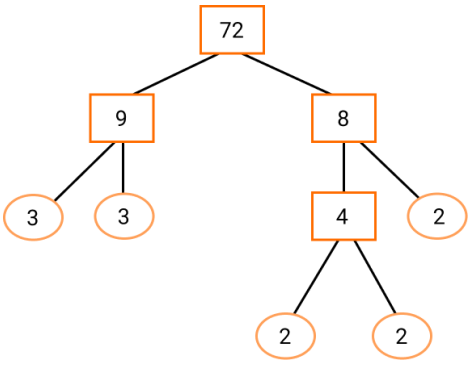
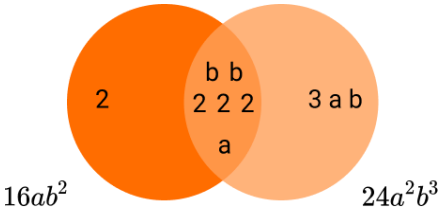
HCF and LCM - Answers

	Question	Answer
	Applied Questions	
1)	**(a)** Two planks of wood are $200cm$ and $240cm$ in length. Each plank of wood is to be cut into the same length pieces. Calculate the maximum length of each piece. **(b)** 3 people are planting trees. Alan plants a tree every 10 minutes. Ben plants a tree every 12 minutes, and Carol plants a tree every 8 minutes. If they each planted trees continuously, how long would it take for them to all plant a tree at the same time?	**(a)** HCF $= 40cm$ **(b)** 120 minutes (2 hours)
2)	**(a)** Two buses leave the depot at 10:30am. Bus A takes 35 minutes to arrive back at the depot, Bus B takes 40 minutes to arrive back at the depot. When are they both back at the depot at the same time? **(b)** Bus A takes on an adult passenger on average every 60 seconds, and a child passenger every 72 seconds. If an adult and a child get onto Bus A at 2:24pm, is Bus B at the depot the next time an adult and a child get onto Bus A together?	**(a)** 280 minutes $=$ 4 hours 40mins, 3:10pm **(b)** 360 seconds $=$ 6 minutes, 2:30pm Bus B is at the depot (40 minutes prior to 3:10pm).
3)	**(a)** Two rectangular cakes are being cut into slices. The first cake is $36cm$ long. The second cake is $40cm$ long. If every slice is to be the same size, what is the greatest possible width of each slice? **(b)** How many slices would there be in total?	**(a)** $4cm$ **(b)** 19 slices

HCF and LCM - Answers

4)	**(a)** A Science technician is trying to sort equipment into groups. Each group is required to have the maximum amount of each piece of equipment possible and the same amount of equipment in each group. There are 360 $250ml$ glasses, 200 conical flasks and 420 pipettes. How many groups of equipment can the Technician make?	**(a)** 20 groups
	(b) A cafe receives a delivery of ice cream in large containers. The container of strawberry ice cream weighs $1.6kg$, vanilla ice cream weighs $2.4kg$ and chocolate ice cream weighs $2kg$. Each dessert must have the same number of scoops of each flavour with no wastage. What is the maximum number of scoops of each flavour ice cream possible in the dessert?	**(b)** $0.4kg$ 4 strawberry 6 vanilla 5 chocolate

HCF and LCM - Mark Scheme

	Question	Answer	
	Exam Questions		
1) (a)	Circle the highest common factor of 6, 16 and 20. 20, 6, 2, 1, 240	(a) 2	(1)
(b)	Circle the lowest common multiple of 4, 12 and 18. 2, 6, 18, 36, 864	(b) 36	(1)
2) (a)	Write 72 as a product of prime factors. Write your answer in index form.	(a)  $72 = 2 \times 2 \times 2 \times 3 \times 3$ $72 = 2^3 \times 3^2$	(3)
(b)	Given that $96 = 2^5 \times 3$, calculate the highest common factor of 72 and 96.	(b) $2^3 \times 3$ HCF $= 24$	(2)
(c)	Calculate the lowest common multiple of 72 and 96.	(c) $24 \times 3 \times 2 \times 2$ LCM $= 288$	(2)
3) (a)	Calculate the lowest common multiple of $24a^2b^3$ and $16ab^2$.	(a)  $\text{LCM} = 2 \times (b^2 \times 2^3 \times a) \times (3 \times a \times b)$ $\text{LCM} = 16a^2b^3$	(3)

HCF and LCM - Mark Scheme

(b)	The Contented Sole fish and chip shop need to order their stock for the next week. They can buy fresh fish in boxes of 30, and bags of potatoes, that would each be shared into 50 portions of chips. What is the minimum number of boxes of fish and bags of potatoes, so that the shop can sell 'fish and chips' with no portions left over?	**(b)** LCM $(30, 50) = 150$ $150 \div 30 = 5$ boxes of fish $150 \div 50 = 3$ bags of potatoes	**(3)**
4) (a)	Given that $54x = 2 \times 3^3 \times x$, calculate the highest common factor of $90x^2$ and $54x$.	**(a)** $90x^2 = 2 \times 3^2 \times 5 \times x^2$ HCF $= 2 \times 3^2 \times x = 18x$	**(2)**
(b)	Hence simplify $\frac{54x}{90x^2}$.	**(b)** $\frac{3}{5x}$	**(2)**