5-a-01：能在具體情境中，理解乘法對加法的分配律，

並運用於簡化心算。

5-a-02：能在具體情境中，理解先乘再除與先除再乘的

結果相同，也理解連除兩數相當於除以此兩數之積。

4-a-01：能在具體情境中，理解乘法結合律、先乘再除

與先除再乘的結果相同，也理解連除兩數相當於除以此兩數之積

5-a-03：能熟練運用四則運算的性質，做整數四則混合

計算。

5-a-04：能將整數單步驟的具體情境問題列成含有未知

數符號的算式，並能解釋算式、求解及驗算。

5-a-01：能在具體情境中，理解乘法對加法的分配律，

並運用於簡化心算。

※ 下列哪一個算式是**錯誤**的？



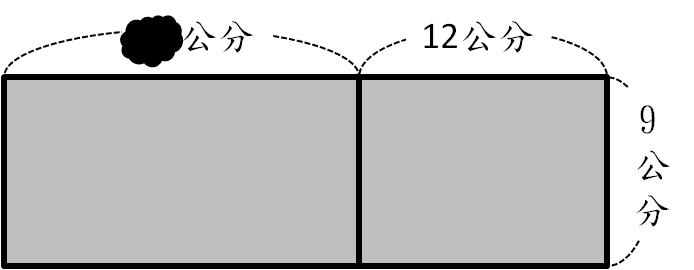






|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | ------------------------------------------------------------------------------------- | | | | | | | | | | | 選 項 | 1 | 2 | 3 | | 4\* | | | 其他 | | | ------------------------------------------------------------------------------------- | | | | | | | | | | | 選項率 | 10% | **47%** | 8% | | **32%** | | | 4% | | | 高分組 | 0.03 | **0.37** | 0.02 | | **0.58** | | | 0.01 | | | 低分組 | 0.18 | **0.43** | 0.17 | | **0.18** | | | 0.04 | | | ------------------------------------------------------------------------------------- | | | | | | | | | | | 難 度0.38 | 鑑別度0.39 | | |  | |  |  | |  | | ------------------------------------------------------------------------------------- | | | | | | | | | | | |
| 分年細目 | 5-a-01能在具體情境中，理解乘法對加法的分配律，並運用於簡化心算。 |
| 認知層次 | 概念理解 |

**※** 安安計算完下面圖形的面積後，不小心將一個邊長的數字弄髒了，弄髒部分的數字是多少？



安安的解題紀錄:

30×9＝270

答:270平方公分

9 18 21 30

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | ------------------------------------------------------------------------------------- | | | | | | | | | | | 選 項 | 1 | 2\* | 3 | | 4 | | | 其他 | | | ------------------------------------------------------------------------------------- | | | | | | | | | | | 選項率 | 3% | **78%** | 5% | | 13% | | | 0% | | | 高分組 | 0.00 | **0.98** | 0.00 | | 0.01 | | | 0.00 | | | 低分組 | 0.10 | **0.42** | 0.16 | | **0.31** | | | 0.01 | | | ------------------------------------------------------------------------------------- | | | | | | | | | | | 難 度0.70 | 鑑別度0.56 | | |  | |  |  | |  | | ------------------------------------------------------------------------------------- | | | | | | | | | | | | |
| 分年細目 | 5-a-01 能在具體情境中，理解乘法對加法的分配律，並運用於簡化心算。 |
| 認知層次 | 解題思考 |

**※** 曉華每天存50元，小明每週存50元，請問下列哪個算式**不能**算出兩個人6週後一共存了多少錢？

① (50＋50)×6 ② 50×(7＋1)×6

③ (50×7＋50)×6 ④ 50×(7×6＋6)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| --------------------------------------------------------------------------------------- | | | | | | | |
| 選　項 | 1\* | 2 | | 3 | 4 |  |  |
| --------------------------------------------------------------------------------------- | | | | | | | |
| 選項率 | 0.61 | 0.15 | | 0.09 | 0.11 |  | 通過率：0.61 |
| --------------------------------------------------------------------------------------- | | | | | | | |
| 高分組 | 0.91 | 0.03 | | 0.03 | 0.03 |  | 鑑別度：0.6 |
| 低分組 | 0.31 | 0.25 | | 0.16 | 0.19 |  |  |
| --------------------------------------------------------------------------------------- | | | | | | | |
| 分年細目 | | | 5-a-01能在具體情境中，理解乘法對加法的分配律，並運用於簡化心算。 | | | | |
| 認知層次 | | | 概念理解 | | | | |

※ 下列哪一個算式的答案和「199×98－97×96」的答案相同？

① (200－1)×98－(100－3)×96

② 199×(100－2＋100－3)×96

③ 199×1×96

④ 19405×96

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| --------------------------------------------------------------------------------------- | | | | | | | |
| 選　項 | 1\* | 2 | | 3 | 4 |  |  |
| --------------------------------------------------------------------------------------- | | | | | | | |
| 選項率 | 0.77 | 0.12 | | 0.06 | 0.04 |  | 通過率：0.77 |
| --------------------------------------------------------------------------------------- | | | | | | | |
| 高分組 | 0.97 | 0.01 | | 0.01 | 0.00 |  | 鑑別度：0.51 |
| 低分組 | 0.46 | 0.27 | | 0.14 | 0.11 |  |  |
| --------------------------------------------------------------------------------------- | | | | | | | |
| 分年細目 | | | 5-a-01能在具體情境中，理解乘法對加法的分配律，並運用於簡化心算。 | | | | |
| 認知層次 | | | 概念理解 | | | | |

乘法對加法的分配律：

乘法對加法的右分配律

(a＋b)×c＝a×c＋b×c

乘法對加法的左分配律

a×(b＋c)＝a×b＋a×c

52×7＝(50＋2)×7 7×52＝7×(50＋2)

右分配律比左分配律簡單

(a＋b)×c 🢧 a×c＋b×c

乘法概念

a×c＋b×c 🢧 (a＋b)×c

因式分解概念

49×199＋49＝？　　87×(98＋2)＝？

乘法概念比因式分解概念簡單

49×199＋49＝？

49×(199＋1)＝49×199＋49×1

49×199＋49＝49×199＋49×1

※ 根據四則運算的規則，下列哪一個敘述是錯誤的？

① 48×199×8 可以用48×100－199×8 來計算

② 530×101 可以用53000＋530 來計算

③ 3001×99 可以用3001×100－3001 來計算

④ 80000÷32÷4 可以用80000÷ ( 32×4 )來計算

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ------------------------------------------------------------------------------------- | | | | | | | | | |
| 選 項 | 1\* | 2 | 3 | | 4 | | | 其他 | |
| ------------------------------------------------------------------------------------- | | | | | | | | | |
| 選項率 | **50%** | 21% | 14% | | 14% | | | 1% | |
| 高分組 | **0.84** | 0.07 | 0.04 | | 0.04 | | | 0.00 | |
| 低分組 | **0.23** | **0.28** | **0.23** | | **0.24** | | | 0.02 | |
| ------------------------------------------------------------------------------------- | | | | | | | | | |
| 難 度0.54 | 鑑別度0.61 | | |  | |  |  | |  |
| ------------------------------------------------------------------------------------- | | | | | | | | | |

5-a-04：能將整數單步驟的具體情境問題列成含有未知

數符號的算式，並能解釋算式、求解及驗算。

※ 老師將156顆糖果分給若干個小朋友，每個小朋友得到6顆糖果，還剩下12顆，如果代表小朋友的人數，下列哪一個選項列出的算式及答案都是正確的？

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| |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | ------------------------------------------------------------------------------------- | | | | | | | | | | | 選 項 | 1 | 2 | 3\* | | 4 | | | 其他 | | | ------------------------------------------------------------------------------------- | | | | | | | | | | | 選項率 | 11% | 13% | **59%** | | 16% | | | 1% | | | 高分組 | 0.02 | 0.03 | **0.86** | | 0.09 | | | 0.00 | | | 低分組 | 0.22 | 0.23 | **0.33** | | 0.20 | | | 0.02 | | | ------------------------------------------------------------------------------------- | | | | | | | | | | | 難 度0.59 | 鑑別度0.53 | | |  | |  |  | |  | | ------------------------------------------------------------------------------------- | | | | | | | | | | | |
| 分年細目 | 5-a-03能解決使用未知數符號所列出的單步驟算式題，並嘗試解題及驗算其解。 |
| 認知層次 | 概念理解 |

※ 下列哪一個選項所算出來的y值，與其他三個**不同**？

y×3=12 y÷6=24 17-y=13 28+y=32

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | ------------------------------------------------------------------------------------- | | | | | | | | | | | 選 項 | 1 | 2\* | 3 | | 4 | | | 其他 | | | ------------------------------------------------------------------------------------- | | | | | | | | | | | 選項率 | 5% | **74%** | 12% | | 9% | | | 0% | | | 高分組 | 0.00 | **0.97** | 0.02 | | 0.01 | | | 0.00 | | | 低分組 | 0.12 | **0.41** | 0.26 | | 0.20 | | | 0.01 | | | ------------------------------------------------------------------------------------- | | | | | | | | | | | 難 度0.69 | 鑑別度0.56 | | |  | |  |  | |  | | ------------------------------------------------------------------------------------- | | | | | | | | | | | | |
|  |  |
|  |  |

※「校長將900顆糖果全部平分給全校學生，每位學生都分到3顆

糖，請問全校有多少學生？」假設全校學生有*a*人，下列哪一個

列式、答案及驗算都是正確的？

① 列式：900×*a*＝3  
 答案：*a*＝300　　　答：全校有300位學生  
 驗算：300÷3＝100

② 列式：900÷*a*＝3  
 答案：*a*＝300　　　答：全校有300位學生  
 驗算：300÷3＝100

③ 列式：900×*a*＝3  
 答案：*a*＝300　　　答：全校有300位學生  
 驗算：300×3＝900

④ 列式：900÷*a*＝3  
 答案：*a*＝300　　　答：全校有300位學生  
 驗算：300×3＝900

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| --------------------------------------------------------------------------------------- | | | | | | | |
| 選　項 | 1 | 2 | | 3 | 4\* |  |  |
| --------------------------------------------------------------------------------------- | | | | | | | |
| 選項率 | 0.04 | 0.19 | | 0.09 | **0.65** |  | 通過率：0.65 |
| --------------------------------------------------------------------------------------- | | | | | | | |
| 高分組 | 0 | 0.06 | | 0.02 | **0.92** |  | 鑑別度：0.59 |
| 低分組 | 0.12 | 0.29 | | 0.17 | **0.33** |  |  |
| --------------------------------------------------------------------------------------- | | | | | | | |
| 分年細目 | | | 5-a-03能解決使用未知數符號所列出的單步驟算式題，並嘗試解題與思考及驗算其解。 | | | | |
| 認知層次 | | | 解題與思考 | | | | |

甲有27元，乙給他多少元後甲有81元？

五年級：限制學生記成27＋x＝81

利用加減互逆的概念解題

六年級：限制學生記成27＋x＝81

利用等量公理概念解題

a÷b＝q….r 　vs　 a＝b×q＋r

◎必須引入餘數不為0情境的乘除互逆

a÷b＝q…r　🢧「＝」表示得到答案

a＝b×q＋r　🢧「＝」表示兩邊一樣大

5-a-02：能在具體情境中，理解先乘再除與先除再乘的

結果相同，也理解連除兩數相當於除以此兩數之積。

※「快樂襪子工廠，每天可以生產3528雙襪子，他們把每12雙襪子裝成一打，請問6天共生產多少打襪子？」。下列哪一個算式能算出正確的答案？

|  |  |
| --- | --- |
| ----------------------------------------------------------------------------------------------------------------------------  選 項 1 2\* 3 4 其他  -----------------------------------------------------------------  選答率 .12 .48 .29 .09 .01 通過率:0. 48  -----------------------------------------------------------------  高分組 .08 .77 .14 .03 .00 難 度:0. 49  低分組 .19 .20 .41 .18 .00 鑑別度:0. 57  ---------------------------------------------------------------------------------------------------------------------------- | |
| 分年細目 | 4-a-01能在具體情境中，理解乘法結合律、先乘再除與先除再乘的結果相同，也理解連除兩數相當於除以此兩數之積 |
| 認知層次 | 概念理解 |

※ 林老師帶了96顆巧克力糖要平分給4組同學，每組各有8人，每人可分得的糖果數**不可以**用下列哪個式子算出？

|  |  |
| --- | --- |
| ------------------------------------------------------------------------------------------------------------------------------  選 項 1 2\* 3 4 其他  -------------------------------------------------------------  選項率 .17 .46 .22 .14 .01 通過率:0.46  -------------------------------------------------------------  高分組 .06 .80 .08 .06 .01 難 度:0.51  低分組 .24 .22 .32 .20 .02 鑑別度:0.59  ------------------------------------------------------------------------------------------------------------------------------ | |
| 分年細目 | 4-a-01能在具體情境中，理解乘法結合律、先乘再除與先除再乘的結果相同，也理解連除兩數相當於除以此兩數之積。 |
| 認知層次 | 解題與思考 |

a÷b×c＝a×c÷b a-b+c＝a+c-b

a÷b÷c＝a(b×c) a-b-c＝a-(b+c)

**※**a、b、c是任意正整數，下列算式

中那些恆成立？

①a÷b×c＝a÷(b×c)。

②a÷b÷c＝a÷(b÷c)。

③a×b÷c＝a×(b÷c)。

④a×b÷c＝a÷b×c。

解題策略：①代數字

②代公式(乘除公式)

③倒數概念

**三、四年級 2207797**

**四、五年級 2207800**