

Math 303

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#11. (a)
$$\begin{array}{r} 8 \overline{) 623} \\ \underline{-400} \\ 223 \\ \underline{-160} \\ 63 \\ \underline{-40} \\ 23 \\ \underline{-16} \\ 7 \end{array} \begin{array}{l} 50 \\ 20 \\ 5 \\ 2 \\ \hline 77 \end{array}$$

$77 \text{ R } 7$

$$\begin{array}{r} 8 \overline{) 623} \\ \underline{-56} \\ 63 \\ \underline{-56} \\ 7 \end{array} \text{ R } 7$$

(b)
$$\begin{array}{r} 36 \overline{) 298} \\ \underline{-180} \\ 118 \\ \underline{-72} \\ 46 \\ \underline{-36} \\ 10 \end{array} \begin{array}{l} 5 \\ 2 \\ 1 \\ 8 \end{array}$$

$8 \text{ R } 10$

$$\begin{array}{r} 36 \overline{) 298} \\ \underline{-288} \\ 10 \end{array} \text{ R } 10$$

(c)
$$\begin{array}{r} 391 \overline{) 4001} \\ \underline{-3910} \\ 91 \\ \underline{-91} \\ 0 \end{array} \begin{array}{l} 10 \\ 10 \end{array}$$

$10 \text{ R } 91$

$$\begin{array}{r} 391 \overline{) 4001} \\ \underline{-391} \\ 91 \\ \underline{-91} \\ 0 \end{array} \text{ R } 91$$

#12. $10x = 300$
 $x = 30$

$30 \div 10 = 3$
The answer should have been 3.

#13.

Input	
4	$((4+5) \cdot 4 - 6) \div 2 = (9 \cdot 4 - 6) \div 2 = (36 - 6) \div 2 = 30 \div 2 = 15$
0	$((0+5) \cdot 4 - 6) \div 2 = (5 \cdot 4 - 6) \div 2 = (20 - 6) \div 2 = 14 \div 2 = 7$
	$(19 \cdot 2 + 6) \div 4 - 5 = (38 + 6) \div 4 - 5 = 44 \div 4 - 5 = 11 - 5 = 6$
	$(31 \cdot 2 + 6) \div 4 - 5 = (62 + 6) \div 4 - 5 = 68 \div 4 - 5 = 17 - 5 = 12$

#15. Molly
 $160 \div 4 = 40 \text{ pages/hour}$
 $200 \div 40 = 5 \text{ hours}$

Karly
 $100 \div 4 = 25 \text{ pages/hour}$
 $200 \div 25 = 8 \text{ hours}$
 $8 - 5 = 3$

Molly will read the book in 3 hours less time than Karly.

#16. Let x represent the number of pennies in the third box

$3x$
1356

$2(3x)$
2712

x
452

$3x + 2(3x) + x = 4520$
 $3x + 6x + x = 4520$
 $10x = 4520$
 $x = 452$
 $3x = 1356$
 $2(3x) = 2712$

The three boxes contain 1356, 2712, and 452 pennies, respectively.

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#18(b)

$$\begin{array}{r} 5 \overline{) 2515} \\ -25 \\ \hline 15 \\ -15 \\ \hline 0 \end{array}$$

Student is missing the 0 ten's place-value.

#20.

$$\begin{array}{r} 57 \\ 29 \overline{) 1672} \\ -145 \\ \hline 222 \\ -203 \\ \hline 19 \end{array}$$

The school will need to rent 58 buses.
At least one bus will not be full.

#24.

(a) 32_{five}
 $\times 4_{\text{five}}$

 13
 220

 233_{five}

(b)

$$\begin{array}{r} 4 \overline{) 23} \\ -13 \\ \hline 10 \\ -4 \\ \hline 1 \\ 3 \end{array}$$

$3_{\text{five}} R. 1_{\text{five}}$

(c)

	4	3	
1	1	1	2
	2	0	
5	2	1	3
	0	3	
	1	3	

1513_{six}

(d)

$$\begin{array}{r} 3 \overline{) 143} \\ -110 \\ \hline 33 \\ -33 \\ \hline 11 \end{array}$$

31_{five}

(e)

$$\begin{array}{r} 11 \overline{) 10010} \\ -1100 \\ \hline 110 \\ -110 \\ \hline 110_{\text{two}} \end{array}$$

(f)

$$\begin{array}{r} 10110_{\text{two}} \\ \times 101_{\text{two}} \\ \hline 10110 \\ 1011000 \\ \hline 1101110_{\text{two}} \end{array}$$

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$$\begin{array}{r} 58 \\ \times 2 \\ \hline 116 \end{array}$$

$$\begin{array}{r} 9R8 \\ 12 \overline{) 116} \\ -108 \\ \hline 8 \end{array}$$

Ten cartons of eggs will be needed for the breakfast.

Worksheet

#1. (a)
$$\begin{array}{r} 15 \overline{) 79} \\ \underline{-45} \\ 34 \\ \underline{-30} \\ 4 \end{array} \begin{array}{l} 3 \\ 2 \\ 5 \end{array}$$

 5 R. 4

$$\begin{array}{r} 5 \text{ R} 4 \\ 15 \overline{) 79} \\ \underline{-75} \\ 4 \end{array}$$

(b)
$$\begin{array}{r} 24 \overline{) 704} \\ \underline{-480} \\ 224 \\ \underline{120} \\ 104 \\ \underline{-96} \\ 8 \end{array} \begin{array}{l} 20 \\ 5 \\ 4 \\ 29 \end{array}$$

 29 R. 8

$$\begin{array}{r} 29 \text{ R} 8 \\ 24 \overline{) 704} \\ \underline{-48} \\ 224 \\ \underline{-216} \\ 8 \end{array}$$

(c)
$$\begin{array}{r} 34 \overline{) 3258} \\ \underline{-1700} \\ 1558 \\ \underline{-1360} \\ 198 \\ \underline{-136} \\ 62 \\ \underline{-34} \\ 28 \end{array} \begin{array}{l} 50 \\ 40 \\ 6 \\ 4 \\ 1 \\ 95 \end{array}$$

$$\begin{array}{r} 95 \text{ R. } 28 \\ 95 \text{ R} 28 \\ 34 \overline{) 3258} \\ \underline{-306} \\ 198 \\ \underline{170} \\ 28 \end{array}$$

(d)
$$\begin{array}{r} 231 \overline{) 5948} \\ \underline{-4620} \\ 1328 \\ \underline{-1155} \\ 173 \end{array} \begin{array}{l} 20 \\ 5 \\ 25 \end{array}$$

 25 R 173

$$\begin{array}{r} 25 \text{ R} 173 \\ 231 \overline{) 5948} \\ \underline{-462} \\ 1328 \\ \underline{-1155} \\ 173 \end{array}$$

#2. (a) base three

$$\begin{array}{r} 12 \overline{) 1221} \\ \underline{-1200} \\ 21 \\ \underline{-12} \\ 2 \end{array} \begin{array}{l} 100 \\ 1 \\ 101 \end{array}$$

 101 R. 2 three

$$\begin{array}{r} 101 \text{ R} 2 \text{ three} \\ 12 \overline{) 1221} \\ \underline{-12} \\ 021 \\ \underline{-12} \\ 2 \end{array}$$

(b) base four

$$\begin{array}{r} 13 \overline{) 2130} \\ \underline{-1300} \\ 230 \\ \underline{-130} \\ 100 \\ \underline{-13} \\ 21 \\ \underline{-13} \\ 2 \end{array} \begin{array}{l} 100 \\ 10 \\ 1 \\ 1 \\ 112 \end{array}$$

$$\begin{array}{r} 112 \text{ R} 2 \text{ four} \\ 13 \overline{) 2130} \\ \underline{-13} \\ 23 \\ \underline{-13} \\ 100 \\ \underline{-32} \\ 2 \end{array}$$

(c) base five

$$\begin{array}{r} 23 \overline{) 1342} \\ \underline{-230} \\ 112 \\ \underline{-230} \\ 332 \\ \underline{-230} \\ 102 \\ \underline{-23} \\ 24 \\ \underline{-23} \\ 1 \end{array} \begin{array}{l} 10 \\ 10 \\ 10 \\ 1 \\ 1 \\ 32 \end{array}$$

32 R 1 five

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#2. (c) (continued)

(d) base six

$$\begin{array}{r} 32 \text{ R } 1 \text{ five} \\ 23 \overline{) 1342} \\ \underline{-124} \\ 102 \\ \underline{-101} \\ 1 \end{array}$$

$$\begin{array}{r} 24 \overline{) 2452} \\ \underline{-2400} \\ 52 \\ \underline{-24} \\ 24 \\ \underline{-24} \\ 0 \end{array} \begin{array}{l} 100 \\ 11 \\ 11 \\ 102 \end{array}$$

102_{six}

$$\begin{array}{r} 102 \text{ six} \\ 24 \overline{) 2452} \\ \underline{-24} \\ 52 \\ \underline{-52} \end{array}$$

#3. (a) $2 \overline{) 13}$ (four)

$$\begin{array}{r} 13 \\ 2 \overline{) 32} \\ \underline{20} \\ 12 \\ \underline{-12} \\ 0 \end{array}$$

(b) 34×3

$$\begin{array}{r} 34 \\ \times 3 \\ \hline 22 \\ 140 \\ \hline 212 \end{array} \text{ (five)}$$

(c) 322×4

$$\begin{array}{r} 322 \\ \times 4 \\ \hline 12 \\ 120 \\ 2000 \\ \hline 2132 \end{array} \text{ (six)}$$

(d) 1262×4

$$\begin{array}{r} 1262 \\ \times 4 \\ \hline 11 \\ 330 \\ 1100 \\ 4000 \\ \hline 5441 \end{array} \text{ (seven)}$$

(e) 476×5

$$\begin{array}{r} 476 \\ \times 5 \\ \hline 33 \\ 380 \\ 423 \end{array} \text{ (nine)}$$

#4. Antonio always divides the greater valued digit by the least valued digit and drops the remainder. $237 \div 3 = 112$ since $3 \div 2 = 1$
 $813 \div 3 = 271$ since $8 \div 3 = 2$, $3 \div 1 = 3$, $3 \div 3 = 1$
 $3 \div 3 = 1$

Gloria has reversed the order of the digits writing her digits from right to left as she worked the problem.

Pat does not record a 0 in the place-values where needed.

Kim the solutions are correct.

Terry is doing the same as Antonio, except Terry considers the remainders.

$$\begin{array}{r} 1221 \\ 4 \overline{) 824} \\ \underline{-8} \\ 2 \\ \underline{-2} \\ 4 \\ \underline{-4} \\ 0 \end{array} \begin{array}{l} 8 \div 4 = 2 \\ 4 \div 2 = 2 \\ 4 \div 4 = 1 \end{array}$$

$$\begin{array}{r} 145 \text{ R } 2 \\ 3 \overline{) 237} \\ \underline{13} \\ 17 \\ \underline{-15} \\ 2 \end{array} \begin{array}{l} 3 \div 2 = 1 \text{ R } 1 \\ 13 \div 3 = 4 \text{ R } 1 \\ 17 \div 3 = 5 \text{ R } 2 \end{array}$$