

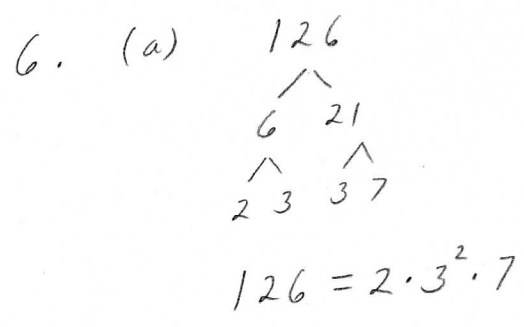
Review Exam III

1. (a) $n(A \times B)$ (b) factor or divisor (c) $b = ac$
 (d) addends (e) multiple (f) relatively prime
 (g) numerator
2. (a) Identity Property for Integer Addition
 (b) Inverse Property for Integer Addition
 (c) Commutative Property for Integer Addition
 (d) Associative Property for Integer Addition
 (e) Inverse Property for Integer Addition
 (f) Identity Property for Integer Addition
 (g) Definition of a Mixed Number
 (h) Distributive Property of Multiplication over Addition of Rational Numbers
 (i) Identity Property for Rational Number Multiplication
 (j) Commutative Property for Rational Number Multiplication
 (k) Closure Property for Rational Number Multiplication
 (l) Closure Property for Rational Number Addition

3. Let $a = n(A)$ and $b = n(B)$ where A and B are finite disjoint sets. Then $a + b = n(A \cup B)$.

4. A prime number is a natural number that has exactly two distinct natural number factors.

5. $91 = 7 \cdot 13$ Therefore, 91 is a composite number.



- (b)
- | | |
|--------------------------------|--------------------------------|
| $2^0 \cdot 3^0 \cdot 7^0 = 1$ | $2^0 \cdot 3^0 \cdot 7^1 = 7$ |
| $2^1 \cdot 3^0 \cdot 7^0 = 2$ | $2^1 \cdot 3^0 \cdot 7^1 = 14$ |
| $2^0 \cdot 3^1 \cdot 7^0 = 3$ | $2^0 \cdot 3^1 \cdot 7^1 = 21$ |
| $2^1 \cdot 3^1 \cdot 7^0 = 6$ | $2^1 \cdot 3^1 \cdot 7^1 = 42$ |
| $2^0 \cdot 3^2 \cdot 7^0 = 9$ | $2^0 \cdot 3^2 \cdot 7 = 63$ |
| $2^1 \cdot 3^2 \cdot 7^0 = 18$ | $2^1 \cdot 3^2 \cdot 7 = 126$ |
- $\{1, 2, 3, 6, 7, 9, 14, 18, 21, 42, 63, 126\}$

7. (a) $\{12, 24, 36, 48, 60, 72, \dots\} \cap \{18, 36, 54, 72, \dots\}$
 $= \{36, 72, 108, \dots\}$
 $\text{LCM}(12, 18) = 36$

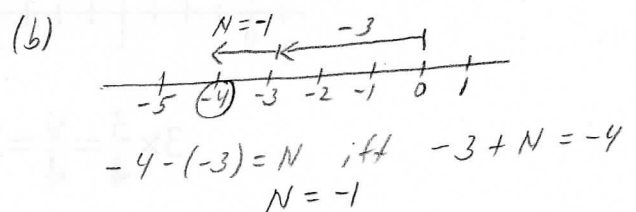
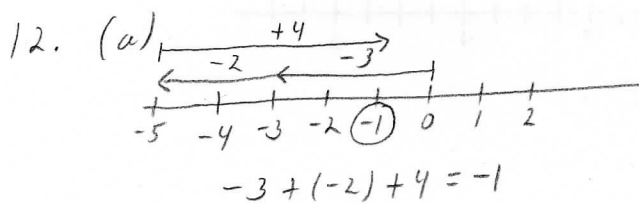
(b) $\{1, 2, 3, 4, 6, 12\} \cap \{1, 2, 3, 6, 9, 18\} = \{1, 2, 3, 6\}$
 $\text{GCD}(12, 18) = 6$

8. $60 = 2 \cdot 3 \cdot 2 \cdot 5$
 $126 = 2 \cdot 3 \cdot 3 \cdot 7$
 $60 = 2^2 \cdot 3 \cdot 5$
 $126 = 2 \cdot 3^2 \cdot 7$
 (a) $\text{LCM}(60, 126) = 2^2 \cdot 3^2 \cdot 5 \cdot 7 = 1,260$
 (b) $\text{GCF}(60, 126) = 2 \cdot 3 = 6$

9. $230 \overline{) 966} \begin{array}{r} 4 \\ -920 \\ \hline 46 \end{array}$ $46 \overline{) 230} \begin{array}{r} 5 \\ -230 \\ \hline 0 \end{array}$ $\text{GCF}(966, 230) = 46$

10. (a) $-7(4) = -28$ (b) $-2(-8-7) = -2(-15) = 30$
 (c) $-31 + 17 = -14$ (d) $-2(3)(-4) = 24$
 (e) $-33 \div (-11) = 3$ (f) $3 + (-4) + 5 - 9 - (-7)$
 $= 3 + (-4) + 5 + (-9) + 7 = 2$
 (g) $9 - (-12) = 9 + 12 = 21$ (h) $-16 + (-18) = -34$

11. (a) $\begin{pmatrix} \bullet \\ \bullet \end{pmatrix} \begin{pmatrix} \bullet\bullet \\ \bullet\bullet\bullet \end{pmatrix} = \begin{pmatrix} \bullet\bullet\bullet \end{pmatrix}$ (b) $\begin{pmatrix} \bullet \\ \bullet \end{pmatrix} \begin{pmatrix} \bullet\bullet\bullet \\ \bullet\bullet\bullet \end{pmatrix} = \begin{pmatrix} \bullet\bullet\bullet \\ \bullet\bullet \end{pmatrix}$ Missing-Addend Model.
 $2 + (-5) = -3$ $-4 - 3 = -7$



13. (a) $-8 + 4 + (-6) = -10$ Pat is 10 points in the hole.
 (b) $(43 - 61) \div 6 = -18 \div 6 = -3$ Each owner has a loss of \$3 million.
 (c) $-6 - (-2) = -6 + 2 = -4$ The temperature dropped 4° from yesterday to today.
 (d) $-38(-716) = 27,208$ The stock was worth \$27,208 more thirty-eight days ago.

$$\begin{array}{r} 716 \\ \times 38 \\ \hline 5728 \\ + 21480 \\ \hline 27208 \end{array}$$

14. $-1\frac{3}{5} = -\frac{8}{5}$ The multiplicative inverse is $-\frac{5}{8}$.

15. False, neither a nor b can be 0.

16. (Answers will vary) Here are several sample solutions.

$$\frac{4}{5}, \frac{8}{10}, \frac{16}{20}, \frac{20}{25}, \frac{24}{30}, \frac{28}{35}, \frac{32}{40}, \frac{36}{45}, \dots$$

17. $\frac{36}{84} = \frac{3 \cdot 12}{7 \cdot 12} = \frac{3}{7}$

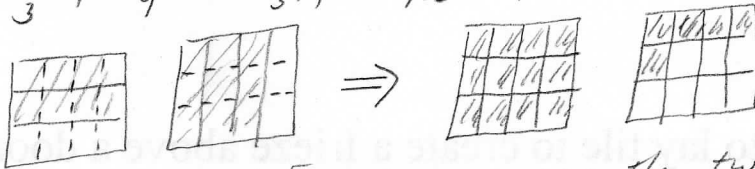
$$\begin{array}{cc} 36 & 84 \\ \wedge & \wedge \\ 6 & 6 \\ \wedge & \wedge \\ 2 \cdot 3 & 2 \cdot 3 \end{array}$$

$$\text{GCD}(36, 84) = 2^2 \cdot 3 = 12$$

$$36 = 2^2 \cdot 3^2$$

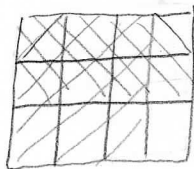
$$84 = 2^2 \cdot 3 \cdot 7$$

18. (a) $\frac{2}{3} + \frac{3}{4} = \frac{2 \cdot 4}{3 \cdot 4} + \frac{3 \cdot 3}{4 \cdot 3} = \frac{8}{12} + \frac{9}{12} = \frac{17}{12} = 1\frac{5}{12}$



Terry ate $1\frac{5}{12}$ pizzas over the two days.

(b) $\frac{2}{3} \cdot \frac{3}{4} = \frac{6}{12} = \frac{1 \cdot 6}{2 \cdot 6} = \frac{1}{2}$



Jerry and Terry ate one-half of a pan of brownies.

