

10. (a) False; Let $A = \{1, 2\}$ and $B = \{1\}$.
 (b) True
 (c) True
 (d) True
 (e) False; The empty set is equivalent to itself.
11. 7
12. (a) Commutative Property of Addition
 (b) Commutative Property of Addition
 (c) Multiplicative Identity
 (d) Distributive Property of Multiplication over Addition
 (e) Associative Property of Addition
 (f) Associative Property of Multiplication
13. (a) Let $k = 2$. Since $2 + 5 = 7$, then $5 < 7$.
 (b) Let $k = 4$. Since $18 = 4 + 14$, then $18 > 14$.
14. (a) $\{0, 1, 2, 3, 4\}$ (b) $\{19\}$ (c) $\{0, 1, 2, \dots, 14\}$
15. (a) $18x$ (b) $13x^3$ (c) $ab + ac + ad$
16. \$10,020
17. $0 \div 0$ is defined then it must equal to some unique number x such that $0 = 0 \cdot x$. Because no unique whole number exists, $0 \div 0$ has no meaning.
18. $q = 21, r = 4$
19. By definition of division in terms of multiplication, $a \div b = c$ if $a = c \cdot b$.
 Substituting $a \div b$ for c in the last equation we have: $a \div b = a \div b$ and $a = (a \div b) \cdot b$.