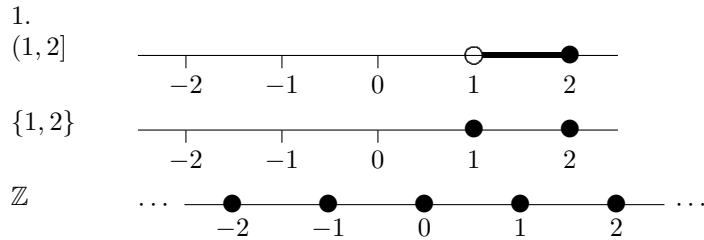
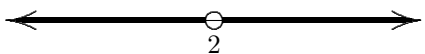


## SOLUTIONS TO EXERCISES: HOLDING THIS, HOLDING THAT

### IN-SECTION EXERCISES:



2.  $w$  can 'hold' any of the numbers in the set  $[0, 1]$
3.  $w$  can 'hold' any of the numbers in the set  $[0, 2]$
4. The order that you multiply two numbers does not affect the result. That is, you can 'commute' the numbers in a multiplication problem without affecting the result.
5. For all real numbers  $x$ ,  $y$ , and  $z$ ,  $x \cdot (y \cdot z) = (x \cdot y) \cdot z$ .
6. For all  $x \in \mathbb{R}$  and  $y \in \mathbb{R}$ ,  $x \cdot y = y \cdot x$ .  
For all  $x \in \mathbb{R}$ ,  $y \in \mathbb{R}$ , and  $z \in \mathbb{R}$ ,  $x \cdot (y \cdot z) = (x \cdot y) \cdot z$ .
7.  $ab$ ,  $3x$ ,  $5ac$ ,  $12$
- 8a.  $3x - 4$
- 8b.  $3(x - 4)$
- 8c.  $\frac{x}{2} + 1$
- 8d.  $\frac{x+1}{2}$
- 9a. Take a number, multiply by 5, then subtract 3.
- 9b. Take a number, subtract 3, then multiply by 5.
- 9c. Take a number, divide by 4, then subtract 1.
- 9d. Take a number, subtract 1, then divide by 4.
10. (a)  $d$  (b)  $t$  (c)  $s$  (d)  $v$
- 11a.  $(0.7)(170) = 119$ ; you owe \$119
- 11b.  $(0.8)(119) = 95.2$ ; you owe \$95.20
- 11c.  $(1.05)(95.2) = 99.96$ ; you owe \$99.96
- 11d. You'll get 4¢ change!
- 12a. What number is equal to 5? ANS: 5
- 12b. What numbers are not equal to 2? ANS: All real numbers except 2: 
- 12c. Three times what number gives 12? ANS: 4
- 12d. What number, divided by 3, gives 4? ANS: 12
- 12e. What number, plus itself, plus itself again, gives 12? ANS: 4
- 12f. Two plus what number is the same as two minus that number? ANS: 0
- 12g. Fifteen, divided by what number, gives 3? ANS: 5
- 12h. Twelve, minus some number, minus the number again, gives 10. What is the number? ANS: 1

13a. Since the universal set is  $\mathbb{R}$ , the best choice is ‘Let  $x \in \mathbb{R}$ ’. Read as: ‘Let  $x$  be in arr’ or ‘Let  $x$  be a real number’.

13b. Since the universal set is  $\mathbb{Z}$ , the best choice is ‘Let  $k \in \mathbb{Z}$ ’. Read as: ‘Let  $k$  be in zee’ or ‘Let  $k$  be an integer’.

13c. Since  $[0, 2]$  is an interval of real numbers, the best choice is ‘For all  $t \in [0, 2]$ ’. You could read this as: ‘For all real numbers  $t$  between 0 and 2 (including the endpoints)’.

13d. Since  $\{1, 2, 3, \dots\}$  is a subset of the integers, the best choice is ‘For all  $i \in \{1, 2, 3, \dots\}$ ’. You could read this as: ‘For all positive integers  $i$ ’.

14a. number

14b. set

14c. number with universal set  $\mathbb{R}$  (or some *interval* of real numbers)

14d. number with universal set  $\mathbb{Z}$  (or some subset of  $\mathbb{Z}$ )

14e. set

14f. number with universal set  $\mathbb{R}$  (or some *interval* of real numbers)

#### END-OF-SECTION EXERCISES:

16. EXP, number

17. SEN, T

18. EXP, number

19. SEN, T

20. EXP, set

21. SEN, F

22. EXP, number

23. SEN, T

24. EXP, set

25. SEN, true

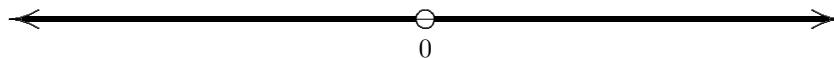
26. SEN, ST/SF

27. Twenty, divided by what number, gives 5? ANS: 4

28. What number, subtracted from 20, gives 2? ANS: 18

29. What number has the property that 3 times it is the same as 4 times it? ANS: 0

30. What number(s) have the property that 3 times them is not the same as 4 times them? ANS: all real numbers except 0



31. What number(s) have the property that when you add one to them, you get something different than when you add two to them? ANS: all real numbers



$$\lim_{n \rightarrow \infty} \left( 88 + \frac{n}{n+1} \right)$$