

Note: This is NOT a practice exam. It is a collection of problems to help you review some of the material for the exam and to practice some kinds of problems. This collection is not necessarily exhaustive. We have covered material in this class that is not represented in this collection. You should expect some problems on the exam to look different from these problems. Be sure to also review your class notes, quizzes, homework assignments, and reading assignments.

Section 1.3

NOTE: Be sure to review Activity Set 1.3 from the Activity Book , pp 15-17.

- Sketch an algebra-piece model for the following problem. Then explain or show how you used it to arrive at your solution. The sum of three integers is 39. The second integer is six more than twice the first. The third integer is three times the first plus 3.
- Find a number such that 5 more than one-half the number is three times the number.
- Solve each of the following:

a. $2x + 5 = \frac{3}{5}x - \frac{3}{5}$	b. $3x - 3 = \frac{3}{2}x + \frac{3}{4}$
c. $-x - 4 > 8$	d. $-2x + 5 < 10$
- Jim spent \$8.70 on school supplies. He bought notebooks, which cost 45 cents each, and folders, which cost 25 cents each. He purchased 4 more folders than notebooks. Let x represent the number of notebooks that he bought.
 - Write an algebraic expression for the total cost of the notebooks.
 - Write an algebraic expression for the total cost of the folders.
- A teacher instructed one of her students as follows: “Pick any number, multiply it by 6, then subtract 8, and divide the result by 2. Now add 4 to the quotient. Tell me your answer, and I will tell you the original number.” What is the teacher doing to determine the original number and why does it work?

ANSWERS Section 1.3

- 5, 16, and 18
- 2
- Solve each of the following:
 - $x = -4$
 - $x = 5/2$
 - $x < -12$
 - $x > -5/2$
- $0.45x$
 - $0.25(x+4)$
- The teacher divides the answer by three to give the original number. The instructions translate to $\frac{6x - 8}{2} + 4$, which simplifies to $3x$.

Section 2.2

- Determine which of the following are functions with domain $D = \{0, 1, 2, 3, \dots\}$. Explain why it is or is not a function.

- a. $f(x) = 5$ for all x in D
- b. $f(x) = 3$ if x is in $\{0,1,2,3\}$ and $f(x) = 0$ if x is not in $\{0,1,2,3\}$
- c. $f(x) = x$ if x is even, $f(x) = 10$ if x is a multiple of seven, and $f(x) = 13 - x$ otherwise.

2. Which of the following are functions with domain $S = \{0, 1, 2, 3, \dots\}$. Be prepared to explain your answer!

- a. $f(x) = 5$ if $x > 7$, $f(x) = 4$ if $x < 7$, and $f(x) = 7$ if $x = 7$.
- b. $g(x) = 2x$ if $x > 4$ and $g(x) = x$ if $x < 6$
- c. $h(x) = 10$ if x is in $\{1, 3, 5, 7, \dots\}$ and $h(x) = 12$ if x is in $\{0, 2, 4, 6, 8, \dots\}$

d.
$$j(x) = \begin{cases} x & \text{if } x < 3 \\ x+1 & \text{if } 3 \leq x < 7 \\ x-1 & \text{if } x \geq 7 \end{cases}$$

3. Do the ordered pairs describe functions? If not, explain why.

- a. $\{(2,3), (3,4), (4,3), (5,4)\}$
- b. $\{(6,4), (4,3), (10,7), (6,3)\}$
- c. $\{(3,3), (4,3), (6,3), (7,3)\}$

4. Which of the following are functions from $\{1, 2, 3, 4, 5\}$ to $\{v, w, x, y, z\}$

- a. $\{(1,w), (2, x), (4, z), (5, v), (3, x)\}$
- b. $\{(2, z), (1, y), (5, w), (4, x), (3, z)\}$
- c. $\{(5,x), (1, v), (3, w), (4, z), (2, y), (3, z)\}$

5. Consider the function $f(t) = 5t - 7$, with the domain $N = \{1, 2, 3, \dots\}$. Which of the following numbers are in the range of the function. If they are in the range, what value of t corresponds to that number?

- a. 3 b. 14 c. 5 d. 13

6. Let $g(x) = 4x + 3$ with domain $D = \{0, 1, 2, 3, 4, 5, \dots\}$. Determine whether the function takes on the following values. If yes, give the value of x that results in the given value. If no, explain why.

- a. 0 b. 15 c. 3

7. For each of the following, write the equation of the line determined by the given pair of points in slope-intercept form:

- a. $(1,0)$ and $(4, 7)$
- b. $(0,0)$ and $(3,8)$

8. Write the equation of the line which passes through the point $(-3, 0)$ and whose slope is 4.

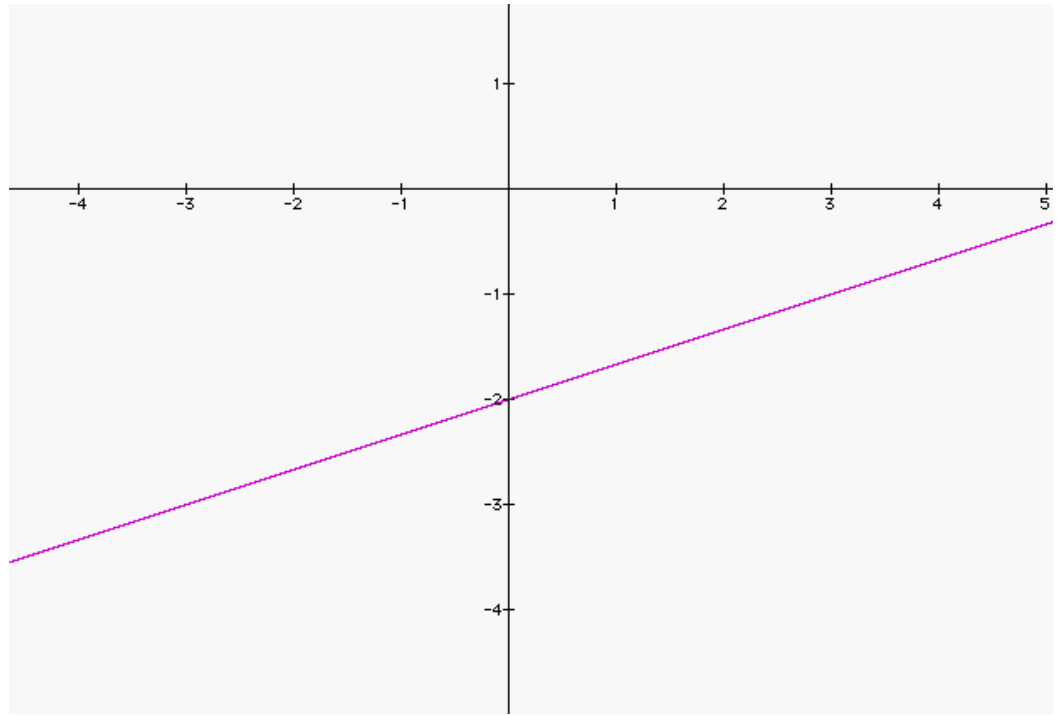
9. Examine the following graph:

For each equation below, state whether the equation *might be* that of the graph given above or whether the equation *cannot be* that of the graph above. Most importantly, **you must** state a reason for your answer.

a. $y = -\frac{1}{2}x + 3$

b. $y = \frac{1}{3}x - 2$

c. $y = 3x - 2$



10. Given the equation $y = 2x + 4$, find the slope of the line, the y-intercept, and sketch the graph.

11. Find the slope of each line:

a. A line through the points $(-1, 2)$ and $(2, -7)$

b. A line through the point $(-17, 63)$ and parallel to the x-axis.

12. Disco Dan's DJ Company charges \$150 for DJ service for the first three hours of your party. He then charges \$25 for every hour after that. If $D(t)$ represents the cost for Dan's DJ service for t hours at your party, write an equation for $D(t)$ in terms of t . How much would you have had to pay Dan if you picked up the bill for his DJ service at your Aunt Edna's 95th birthday party that lasted for 7 hours? (Aunt Edna still knows how to throw a party!)

13. Ben's Truck Rental Company charges \$45 for the rental truck plus \$.50 per mile for every mile over 20.

a. Find the cost for renting Ben's truck for a 40-mile trip.

b. Write a function C where $C(n)$ gives the cost for renting a truck from Ben for an n -mile trip (Assume n is at least 20).

14. A taximeter starts at \$1.60 and increases at the rate of \$1.20 for every minute. Let x represent the number of minutes and $f(x)$ represent the total cost. Write an equation for the total cost as a function of the number of minutes.

ANSWERS Section 2.2

1. a. Yes. Every element in the domain is matched with the same element in the ran, but when you consider any *single* element of the domain, that element is paired with exactly one element of the range.

b. Yes.

c. No. For example, what is $f(14)$?

2. a. YES; every domain value has one and only one range value

b. NO; $g(5)$ has more than one “answer”

c. YES

d. YES

3. a. $\{(2,3), (3,4), (4,3), (5,4)\}$ YES

b. $\{(6,4), (4,3), (10,7), (6,3)\}$ NO: 6 is paired with 4 and with 3.

c. $\{(3,3), (4,3), (6,3), (7,3)\}$ YES

4. a. $\{(1,w), (2, x), (4, z), (5, v), (3, x)\}$ YES

b. $\{(2, z), (1, y), (5, w), (4, x)\}$ YES

c. $\{(5,x), (1, v), (3, w), (4, z), (2, y), (3, z)\}$ NO, 3 is paired with w and with z

5. a. Yes, $t = 2$

b. No. $t = 21/5$, which is not in the domain.

c. No. $t = 12/5$, which is not in the domain.

d. Yes, $t = 4$

6. a. No. $x = -3/4$, which is not in the domain.

b. Yes, $x = 3$.

c. Yes, $x = 0$

7. a. $y = \frac{7}{3}x - \frac{7}{3}$

b. $y = \frac{8}{3}x$

8. $y = 4x + 12$

9. a. Can't be. Slope is negative, but slope of the line in the picture is positive. Also, the y-intercept is positive, but in the picture, it is negative.

b. Could be. Slope looks reasonable, and the y-intercept looks accurate.

c. Can't be, the slope is too large. You might not be able to get an accurate slope from the picture, but it is certainly less than 1.

10. $m = 2$, $(0,4)$

11. $m = -3$
 $m = 0$

12. $D(t) = 150 + 25(t - 3)$. $D(7) = \$250$.

13. a. \$55 b. $C(n) = 45 + 0.5(n - 20)$

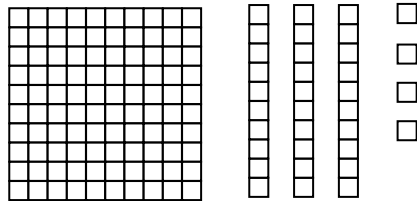
14. $f(x) = 1.60 + 1.20x$

Section 6.1

Textbook p 433 # 1, 2, 4

1. Determine what number is represented by the base-ten pieces below if each:

- Long represents one unit
- Flat represents one unit
- Small square represents one tenth



2. Rewrite the following three numbers in order from smallest to largest. Give a brief explanation of how you decided the correct order.

0.45 $0.4\bar{5}$ $0.\bar{45}$ Correct order: _____

3. Find three numbers between 0.05 and 0.051.

ANSWERS Section 6.1

1. a. 13.4

b. 1.34

c. 13.4

2. 0.45 $0.4\bar{5}$ $0.\bar{45}$

3. Examples: 0.0501, 0.0505, and 0.0509.