

# MATH D UNIT 1 REVIEW

## INSTRUCTIONS:

Show all of your work on separate paper, do not write answers on this review sheet. Number each problem in order on your paper and box your answers. Follow directions for each problem.

### I. Solve the following equations. (See sections 1.4, 1.5)

1)  $\frac{5y+3x}{-3} = -5$ , solve for  $y$ .

2)  $-8 = \frac{2x-7y}{-4}$ , solve for  $x$ .

3)  $\frac{3x}{5} - \frac{x-3}{2} = \frac{x+2}{3}$

4)  $\frac{x}{4} = 2 + \frac{x-3}{3}$

5)  $2(x-1)+3 = x-3(x+1)$

6)  $7x-(2x+2) = x+6(3x-5)$

7)  $7x+5 = 5(x+3)+2x$

8)  $9-4+3x-5 = x+8-2(-x+4)$

### II. Solve the following problems. (See section 1.5)

9) After a 30% reduction, you purchase a dictionary for \$30.80. What was the dictionary's price before the reduction?

10) Including 5% sales tax, an inn charges \$252 per night. Find the inn's nightly cost before the tax is added.

11) After a 20% price reduction, a cordless phone sold for \$48. What was the phone's price before the reduction?

### III. Simplify the expressions below. (See section 1.6)

12)  $\left(\frac{-6z}{z^2}\right)^{-1}$

13)  $\left(\frac{xy^{-1}}{-3x^2y}\right)^2$

14)  $\left(\frac{-2s^3t^{-2}}{st^2}\right)^3$

15)  $\left(\frac{x^{-3}z^8}{2y^0}\right)^{-3}$

16)  $(10xy^0)^{-2}$

17)  $(-5x^0y^{-2})^2$

18)  $(4x^{-3}y)^{-2}$

19)  $(-2x^4y^6)^{-4}$

20)  $\frac{3^3m^{-6}n}{-9m^{-3}n^5}$

21)  $\frac{-2a^{10}b^{-5}}{4a^{20}b^{-1}}$

### IV. Perform the indicated operation. Write your answer in scientific notation. (See section 1.7)

22)  $(4.1 \times 10^{-2})(3 \times 10^{14})$

23)  $\frac{5 \times 10^{12}}{12 \times 10^{-14}}$

24)  $(3.0 \times 10^{-4})(1.5 \times 10^2)$

25)  $\frac{3.6 \times 10^5}{7.2 \times 10^7}$

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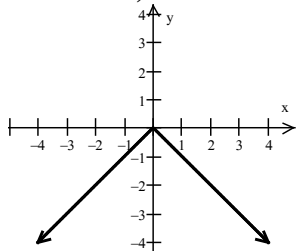
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**V. For problems 26-28, a graph  $f$  has been given. Answer the following questions:**

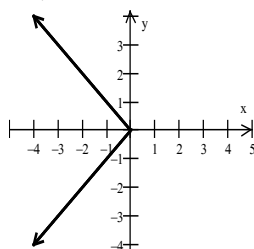
- a) Find the domain of  $f$  in interval notation
- b) Find the range of  $f$  in interval notation
- c) Determine if the graph is a function.
- d) Give the coordinates of the x-intercepts.

(See section 2.2)

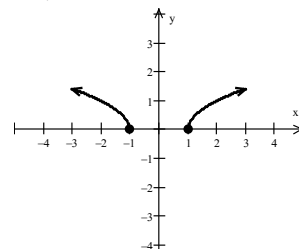
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27)



28)

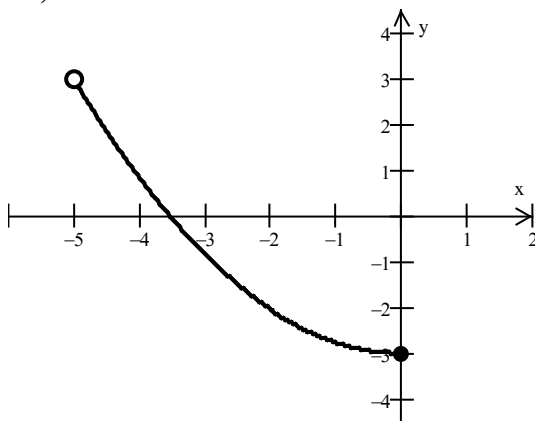


**VI. For problems 29-30, a graph  $f$  has been given. Answer the following questions:**

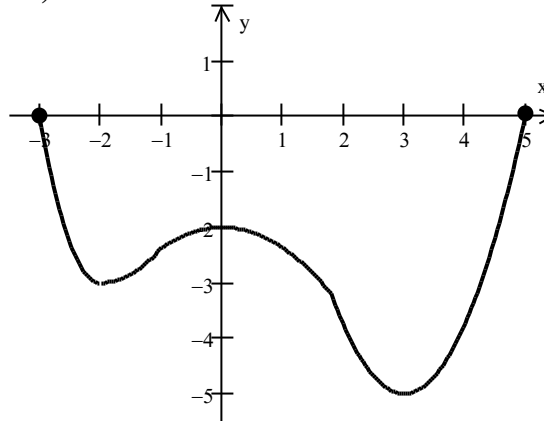
- a) Find the domain of  $f$  in interval notation.
- b) Find the range of  $f$  in interval notation.
- c) Determine if the graph is a function.
- d) Find  $f(0)$
- e) Is  $f(-2)$  positive or negative?

(See section 2.2)

29)



30)



**VII. If  $f(x) = -x^2 + 2x$ , and  $g(x) = -5x + 2$ , find the following: (See sections 2.1, 2.3)**

31)  $f(-2)$

32)  $f(3)$

33)  $g(a+1)$

34)  $g(a-2)$

35)  $(f+g)(x)$

36)  $(f-g)(x)$

37)  $(fg)(1)$

38)  $\left(\frac{f}{g}\right)(-1)$

**VIII. Graph the given functions,  $f(x)$  and  $g(x)$ , in the same rectangular coordinate system. Select integers for  $x$ , starting with  $-2$  and ending with  $2$ . Once you have obtained your graphs, describe how the graph of  $g(x)$  is related to the graph of  $f(x)$ . Include a scale. (See sections 1.3, 2.2)**

39)  $f(x) = x^2$ ,  $g(x) = x^2 - 1$

40)  $f(x) = |x|$ ,  $g(x) = |x| + 2$

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**IX. Graph the line using intercepts and label them on the graph. Include a scale. (See section 2.4)**

41)  $2x + 4y = 3$

42)  $4x - 3y = 10$

**X. Find the slope of each line containing the following pairs of points. Simplify fractions. (See section 2.4)**

43)  $(-3, -4), (2, 6)$

44)  $(5, -3), (5, 7)$

45)  $(-2, 9), (-3, 9)$

46)  $(-8, -5), (3, -3)$

**XI. Write an equation in slope-intercept form of the line passing through each given point with the given parallel/perpendicular properties. (See section 2.5)**

47) through  $(-4, 1)$ , parallel to the line  $y = -x - 5$

48) through  $(2, 8)$ , perpendicular to the line  $-2x + y = -5$

49) through  $(-2, -1)$ , perpendicular to the line  $-x + 3y = -15$

**XII. Solve the following problems: (See section 2.5)**

**50) A sculpture sold for \$55 when it was 3 years old. When it was 10 years old, it was sold again, for \$156.50.**

- Assume that the relationship between the age of the sculpture and its value is linear and write an equation describing this relationship. Use ordered pairs of the form  $(x, y) = (\text{age}, \text{value})$ .
- Describe what the slope means in terms of rate of change in this situation.
- Use your equation to estimate the value of the sculpture when it was 45 years old.

**51) The value of a sofa was \$1200 when it was one year old and was \$200 when it was 5 years old.**

- Assume that the relationship between the age of the sofa and its value is linear and write an equation describing this relationship. Use ordered pairs of the form  $(x, y) = (\text{age}, \text{value})$ .
- Describe what the slope means in terms of rate of change in this situation.
- Use your equation to estimate the value of the sofa when it was new.

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# MATH D UNIT 1 REVIEW *Answers*

1)  $y = -\frac{3}{5}x + 3$

2)  $x = \frac{7}{2}y + 16$

3)  $x = \frac{25}{7}$

4)  $x = -12$

5)  $x = -1$

6)  $x = 3$

7) No Solution  $\emptyset$

8)  $(-\infty, \infty)$

9) \$44.00

10) \$240.00

11) \$60.00

12)  $\frac{z}{-6}$

13)  $\frac{1}{9x^2y^4}$

14)  $\frac{-8s^6}{t^{12}}$

15)  $\frac{8x^9}{z^{24}}$

16)  $\frac{1}{100x^2}$

17) 1

18)  $\frac{x^6}{16y^2}$

19)  $\frac{1}{16x^{16}y^{24}}$

20)  $\frac{-3}{m^3n^4}$

21)  $-\frac{1}{2a^{10}b^4}$

22)  $1.23 \times 10^{13}$

23)  $4.1\bar{6} \times 10^{25}$

24)  $4.5 \times 10^{-2}$

25)  $5.0 \times 10^{-3}$

26) a)  $(-\infty, \infty)$

b)  $(-\infty, 0]$

c) function

d)  $(0, 0)$

27) a)  $(-\infty, 0]$

b)  $(-\infty, \infty)$

c) not a function

d)  $(0, 0)$

28) a)  $(-\infty, -1] \cup [1, \infty)$

b)  $[0, \infty)$

c) function

d)  $(-1, 0)$  and  $(1, 0)$

29) a)  $(-5, 0]$

b)  $[-3, 3)$

c) function

d) -3 e) negative

30) a)  $[-3, 5)$

b)  $[-5, 0]$

c) function

d) -2 e) negative

31)  $f(-2) = -8$

32)  $f(3) = -3$

33)  $g(a+1) = -5a - 3$

34)  $g(a-2) = -5a + 12$

35)  $(f+g)(x) = -x^2 - 3x + 2$

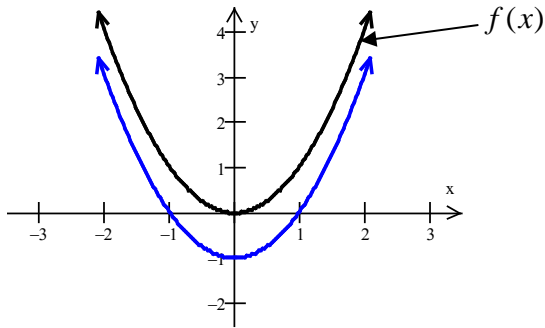
36)  $(f-g)(x) = -x^2 + 7x - 2$

37)  $(fg)(1) = -3$

38)  $\left(\frac{f}{g}\right)(-1) = \frac{-3}{7}$

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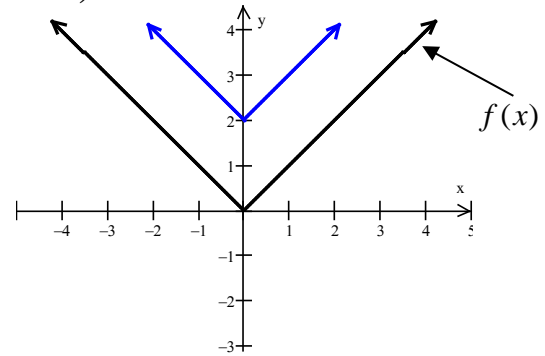
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“The graph of  $g(x)$  is the graph of  $f(x)$  shifted down by 1 unit.”

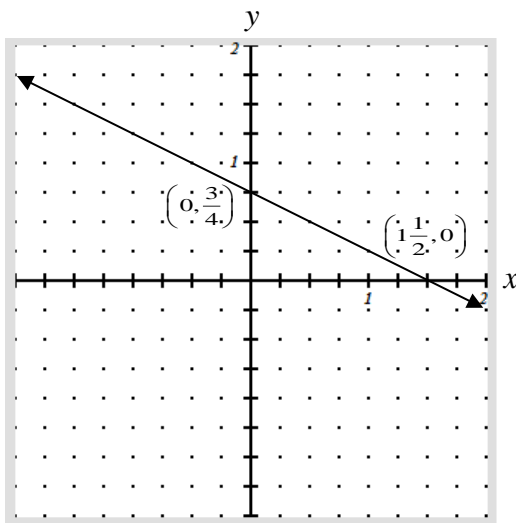
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40)

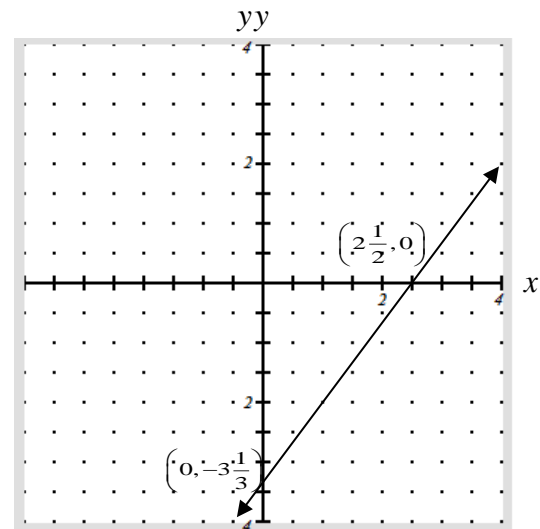


“The graph of  $g(x)$  is the graph of  $f(x)$  shifted up by 2 units.”

41)  $2x + 4y = 3$



42)  $4x - 3y = 10$



43)  $m = 2$

44) *undefined slope*

45)  $m = 0$

46)  $m = \frac{2}{11}$

47)  $y = -x - 3$

48)  $y = -\frac{1}{2}x + 9$

49)  $y = -3x - 7$

50) a)  $y = 14.5x + 11.5$  where  $x$  represents age in years and  $y$  represents value in dollars.

b) The slope is 14.5, representing an increase in value of \$14.50 per year.

c) \$664

51) a)  $y = -250x + 1450$  where  $x$  represents the age in years and  $y$  represents value in dollars.

b) The slope is -250, representing a decrease in value of \$250 per year.

c) \$1450