Honors Math II
Chapter 3 review

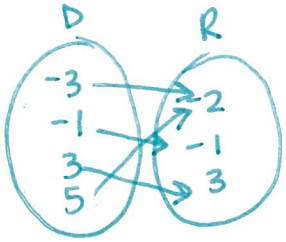
Name Key
Period_____ Date_____

Identify the domain and range of the given relation. Then represent the relation using a mapping diagram.

1. $(5,-2), (-3,-2), (3,3), (-1,-1)$

D: $\{-3,-1,3,5\}$

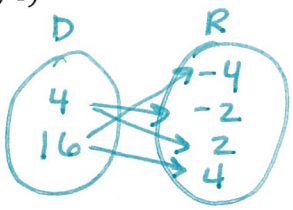
R: $\{-2,-1,3\}$



2. $(4,-2), (4,2), (16,-4), (16,4)$

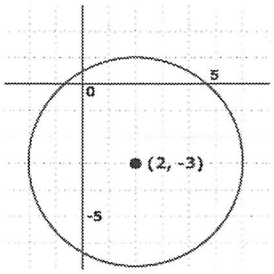
D: $\{4,16\}$

R: $\{-4,-2,2,4\}$



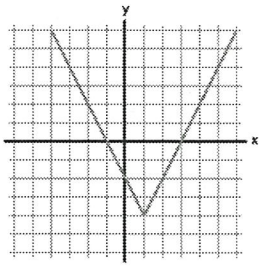
Tell whether the relation is a function and name it.

3.



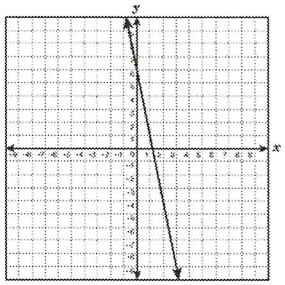
circle
not a function

4.



absolute value
function

5.



Line
function

Tell whether the function is linear. Evaluate for the given value of x.

6. $f(x) = x + 12;\ f(-2)$

linear $f(-2) = 10$

7. $f(x) = x^2 + 1;\ f(6)$

quadratic
Not linear $f(6) = 37$

8. $f(x) = -4;\ f(3)$

linear $f(3) = -4$

9. $f(x) = |x| - 4;\ f(-2)$

absolute value
Not linear $f(-2) = -2$

9. Tell whether **Line 1** and **Line 2** are parallel, perpendicular , or neither.

Line 1 passes through (10, 7) and (13, 9) $m_1 = \frac{7-9}{10-13} = \frac{-2}{-3} = \frac{2}{3}$

Line 2 passes through (-4, 3) and (-1, 5) $m_2 = \frac{3-5}{-4+1} = \frac{-2}{-3} = \frac{2}{3}$

parallel

Find the x and y intercepts of the line with the given equation.

10. $y = 3x - 7$

x: $0 = 3x - 7$
$\frac{7}{3} = x$
$(7/3, 0)$

y: $y = 0 - 7$
$(0, -7)$

11. $3y + 2x = 12$

x: $0 + 2x = 12$
$x = 6$
$(6, 0)$

y: $3y + 0 =$
$y = 4$
$(0, 4)$

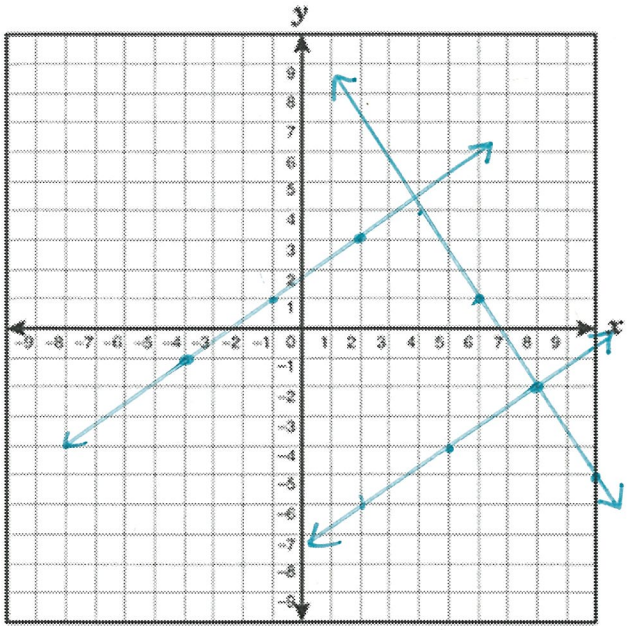
12. The Spendmore family is not very good at budgeting their money. If they initially had \$500 in their bank account and after 8 days only had \$148, write a function that describes their bank balance b as a function of time t in days.

$b(t) = -44t + 500$

$500 - 148 = \frac{352}{8}$

13. Graph and write the equation of the line through the points (-4, -1) and (2, 3).
What is the domain, range and x and y intercepts of the line?

$m = \frac{-1-3}{-4-2} = \frac{-4}{-6} = \frac{2}{3}$



$y = \frac{2}{3}(x+4) - 1$ or $y = \frac{2}{3}(x-2) + 3$

D: $\mathbb{R}$

R: $\mathbb{R}$

x: $0 = \frac{2}{3}(x+4) - 1$

$1 = \frac{2}{3}x + \frac{8}{3}$

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

$x = -\frac{5}{2}$

$(-\frac{5}{2}, 0)$

y: $y = \frac{2}{3}(0+4) - 1$

$y = \frac{8}{3} - 1$

$y = \frac{5}{3}$

$(0, \frac{5}{3})$

Write the equation of the lines that are parallel and perpendicular to the above equation that goes through the point (8, -2). Graph the 2 lines.

parallel

$y = \frac{2}{3}(x-8) - 2$

perpendicular

$y = -\frac{3}{2}(x-8) - 2$

Compare the following functions to the basic/parent function. Give all pertinent information using a-d as a guide.

a) Name it

b) Tell whether the graph reflects or has a positive or negative slope

c) Find the vertex, center, or starting point, etc.

d) Tell whether the function has a vertical shrink, vertical stretch, or the same width as its basic function.

14. $y = 2|x-3| + 6$ absolute value

V: (3,6)

vertical stretch by 2

15. $2x - 4y = 16$ line

x-int: (8,0)

y-int: (0,-4)

slope: $\frac{1}{2}$

16. $y = \sqrt{x} - 6$ square root

start point: (0,-6)

17. $(x-2)^2 + (y+2)^2 = 25$ circle

C: (2,-2)

R: 5

18. $y = -3(x+2)^2 - 4$ parabola/quadratic

V: (-2,-4)

reflects, vertical stretch by 3

19. $y = \frac{1}{2}\sqrt[3]{x-5} + 2$ cube root

start point: (5,2)

vertical shrink by $\frac{1}{2}$

20. $y = -3x^2 - 2x + 5$ parabola/quadratic

$x = \frac{2}{2(-3)} = -\frac{1}{3}$

V: $(-\frac{1}{3}, \frac{16}{3})$

reflect, vertical stretch by 3

21. $y = \frac{3}{4}x - 7$ line

y-int: (0,-7)

x-int: $(\frac{28}{3}, 0)$

slope: $\frac{3}{4}$

Write an equation that satisfies the given information.

22. absolute value

Vertex: $(-2, 0)$ $a = -3$

$y = -3|x+2|$

23. parabola

Vertex: $(3, 6)$ $a = 2$

$y = 2(x-3)^2 + 6$

24. square root

starting point: $(-1, 4)$ $a = 1/2$

$y = \frac{1}{2}\sqrt{x+1} + 4$

25. cube root

center point: $(0, 4)$ $a = -4$

$y = -4\sqrt[3]{x} + 4$

26. circle

Center: $(-3, 4)$ radius = 3

$(x+3)^2 + (y-4)^2 = 9$

27. circle

Center: origin radius = 6

$x^2 + y^2 = 36$

28. line

Slope: $-\frac{2}{3}$ goes through point $(-5, 13)$

$y = -\frac{2}{3}(x+5) + 13$

29. line

Slope: $\frac{5}{3}$ goes through point $(0, -7)$

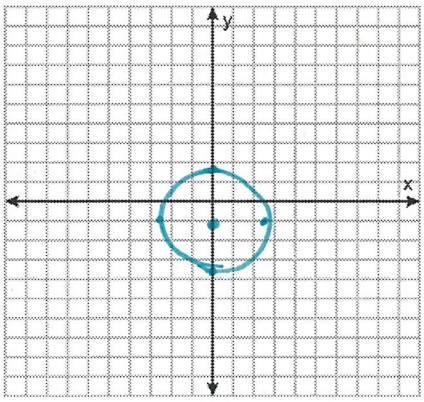
$y = \frac{5}{3}x - 7$

Graph the following equations and state the domain and range using **interval notation**.

30. $x^2 + (y+1)^2 = 7$

C: $(0,-1)$

R: $\sqrt{7}$ ≈ 2.6

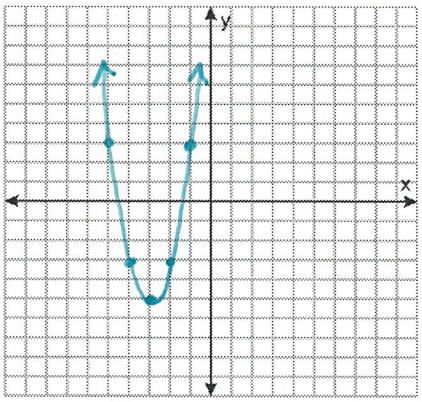


D: $[-\sqrt{7}, \sqrt{7}]$

R: $[-1-\sqrt{7}, -1+\sqrt{7}]$

31. $y = 2(x+3)^2 - 5$

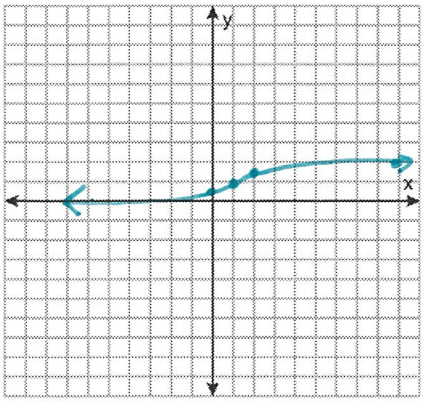
V: $(-3,-5)$



$1(2) = 2$
$3(2) = 6$
$5(2) = 10$
$7(2) = 14$

32. $y = \frac{1}{2}\sqrt[3]{x-1} + 1$

start: $(1,1)$



D: $(-\infty, \infty)$

R: $(-\infty, \infty)$

or

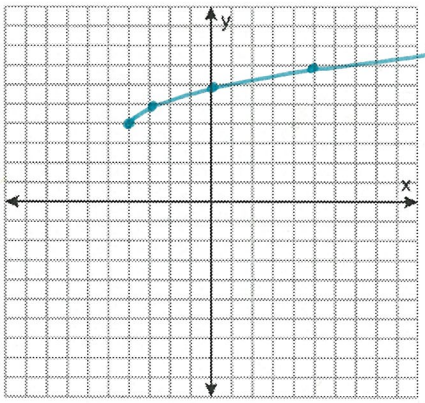
D: $\mathbb{R}$

R: $\mathbb{R}$

$(\frac{1}{2})$ up 1 over 1
$(\frac{1}{2})$ up 1 over 7
$(\frac{1}{2})$ up 1 over 19

33. $y = \sqrt{x+4} + 4$

start: $(-4,4)$



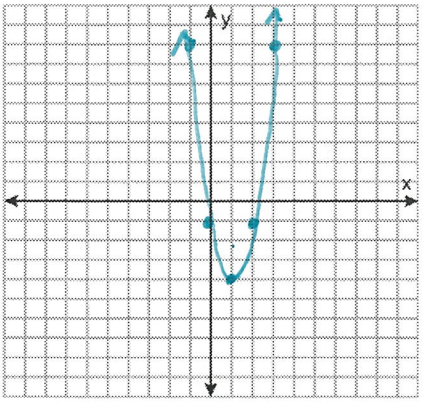
D: $[-4, \infty)$

R: $[4, \infty)$

up 1 over 1
up 1 over 3
up 1 over 5

Graph the following equations and state the domain and range using **inequality notation**.

34. $y = 3x^2 - 6x - 1$



D: $\mathbb{R}$

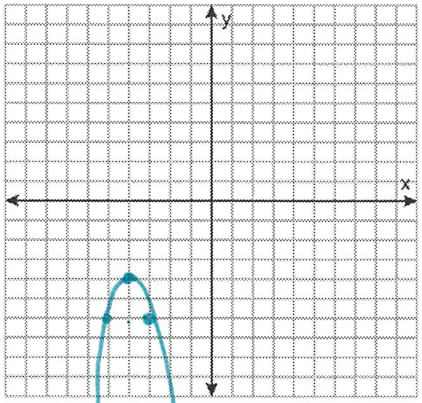
R: $y \geq -4$

$x = \frac{6}{2(3)} = 1$

V: $(1, -4)$

1(3)
3(3)
5(3)
7

35. $y = -2x^2 - 16x - 36$



D: $\mathbb{R}$

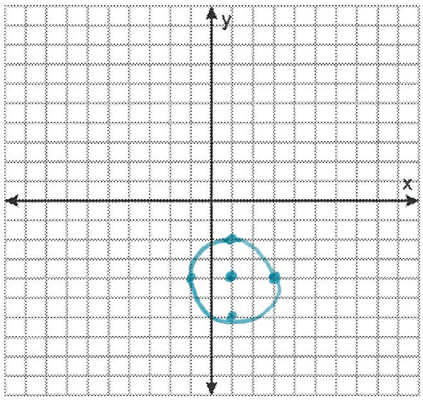
R: $y \leq -4$

$x = \frac{16}{2(-2)} = -4$

V: $(-4, -4)$

1(-2)
3(-2)
5(-2)
7(-2)

36. $(x-1)^2 + (y+4)^2 = 4$



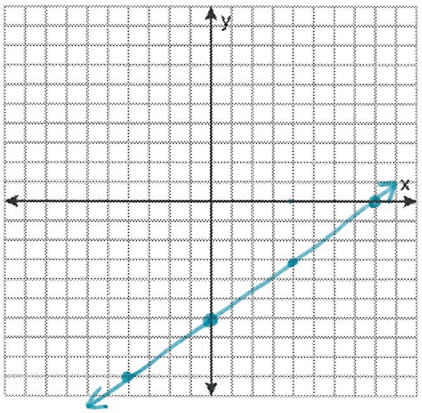
C: $(1, -4)$

R: 2

D: $-1 \leq x \leq 3$

R: $-6 \leq y \leq -2$

37. $3x - 4y = 24$



x-int: $(8, 0)$

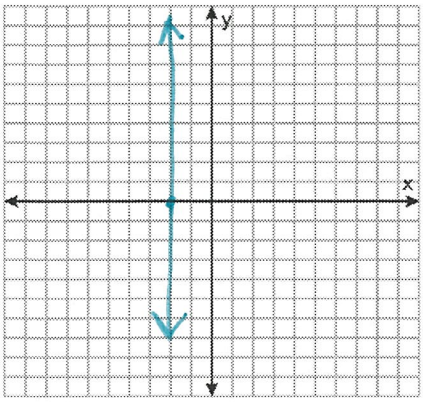
y-int: $(0, -6)$

$m = \frac{6}{8} = \frac{3}{4}$

D: $\mathbb{R}$

R: $\mathbb{R}$

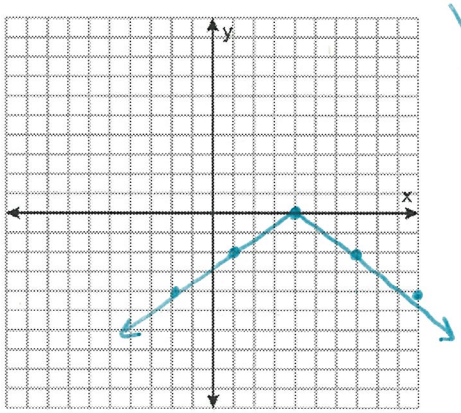
38. $x = -2$



D: $\{-2\}$

R: $\mathbb{R}$

39. $y = -\frac{2}{3}|x - 4|$



V: $(4, 0)$

D: $\mathbb{R}$

R: $y \leq 0$