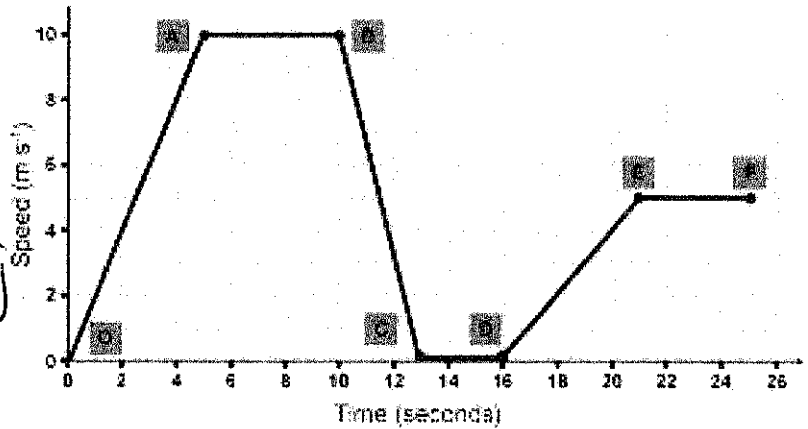


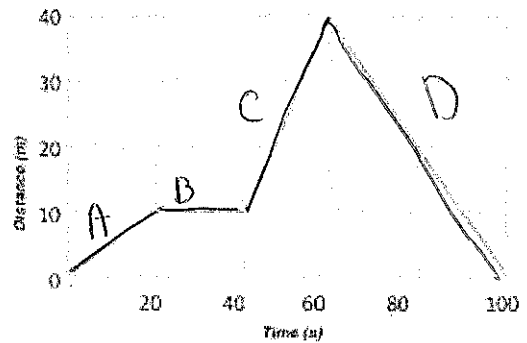
1. Explain what each section of the graph represents in the speed-time graph:

- 0-A Speeds up quickly
- A-B Constant speed
- B-C Stops quickly
- C-D no movement / stopped
- D-E Speeds up gradually
- E-F Constant speed



2. Explain what each section of the graph represents in the distance time graph:

- A walks slowly
- B stops
- C walks quickly
- D turns around + walks home



3. Which of the following is not a function?

A

B

C

or $-\infty < x < \infty$

D

- 4. State the domain and range for graph A: $D: \mathbb{R}$ or $(-\infty, \infty)$ $R: \mathbb{R}$ or $(-\infty, \infty)$ or $-\infty < y < \infty$
- 5. state the domain and range for graph B: $D: -\infty < x \leq a$ or $(-\infty, a]$ $R: \mathbb{R}$ or $(-\infty, \infty)$ or $-\infty < y < \infty$
- 6. State the domain and range for graph C: $D: \mathbb{R}, (-\infty, \infty), -\infty < x < \infty$ $R: (-\infty, a]$ or $-\infty < y < \infty$
- 7. State the domain and range for graph D: $D: -4 \leq x \leq 6$ $R: -5 \leq y \leq 6$ or $-\infty < y \leq 2$

8. The Runner's Club has its members document the miles they run each week. Which member increased his miles at a constant rate? Which runner decreased his miles at a constant rate? Who had no constant rate of increase or decrease?

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Joe	3	6	10	15	21	28	36
Jan	2	5	8	11	14	17	20
Jill	5	7	9	12	16	18	21
Jack	12	11	10	9	8	7	6

Joe & Jill did not have a constant increase or decrease.
 Jan increased by 3 miles each week.
 Jack decreased by 1 mile each week.

9. You make \$12 per hour babysitting. Write a function rule for this situation: $f(h) = 12h$

Use your rule to calculate how much you would make working each of the following times.

Show your work.

3 hours \$36 $12(3)$
 3 hours 15 minutes \$39 $12(3.25)$
 3 hours 30 minutes \$42 $12(3.50)$
 3 hours 45 minutes \$45 $12(3.75)$

15 min = $\frac{1}{4}$ hour
 30 min = $\frac{1}{2}$ hour
 45 min = $\frac{3}{4}$ hour

Evaluate the functions, show ALL work

10. $f(x) = -2x^2$ $f(-4) = -32$ $f(-1) = -2$ $f(7) = -98$
 11. $f(x) = -x^2 - 4$ $f(-4) = -20$ $f(-1) = -5$ $f(7) = -53$
 12. $f(x) = \frac{1}{5}x$ $f(-4) = -\frac{4}{5}$ $f(-1) = -\frac{1}{5}$ $f(7) = \frac{7}{5}$ (no decimals!!)

$10) -2(-4)^2 = -2(16) = -32$
 $-2(-1)^2 = -2(1) = -2$
 $-2(7)^2 = -2(49) = -98$
 $11) -(-4)^2 - 4 = -(16) - 4 = -20$
 $-(-1)^2 - 4 = -(1) - 4 = -5$
 $-(7)^2 - 4 = -(49) - 4 = -53$
 $12) \frac{1}{5}(-4) = -\frac{4}{5}$
 $\frac{1}{5}(-1) = -\frac{1}{5}$
 $\frac{1}{5}(7) = \frac{7}{5}$

13. You have \$400 in your bank account. You have to start paying for your cell phone bill, so you give your parents \$35 each month out of this account.

A. write a function rule $y = -35x + 400$

B. when will you have \$260 left in the account? 4 weeks $260 = -35x + 400$

C. When will you have \$0 left in the account? 11-12 weeks -400

$$0 = -35x + 400$$

$$\begin{array}{r} 0 = -35x + 400 \\ -400 \\ \hline -400 = -35x \end{array}$$

$$x = 11.43$$

$$260 = -35x + 400$$

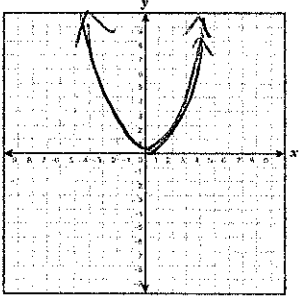
$$\begin{array}{r} 260 = -35x + 400 \\ -400 \\ \hline -140 = -35x \\ x = 4 \end{array}$$

D. Domain $0 \leq x \leq 11.43$ E. Range $0 \leq y \leq 400$

Families of Functions Review

Quadratic Functions: $y = ax^2 + b$

Graph looks like this:



Graph is called a parabola

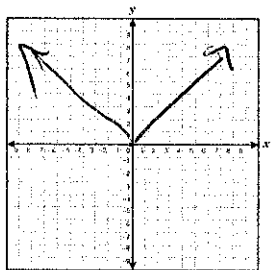
How to tell if it opens up or down: *look at coefficient of x^2*

$Y = 3x^2 - 5$ opens up
Because 3 is positive

$Y = -3x^2 + 5$ opens down
Because 3 is negative

Absolute Value functions: $y = |x|$

Graph looks like this:



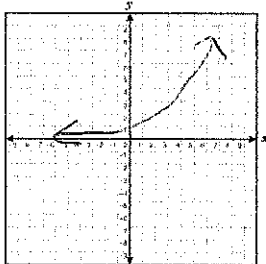
How to tell if it opens up or down: *look at sign in front of abs. value.*

$Y = |-3x| - 5$ opens up
Because abs. value is pos.

$Y = -|-3x| - 5$ opens down
Because abs. value is negative

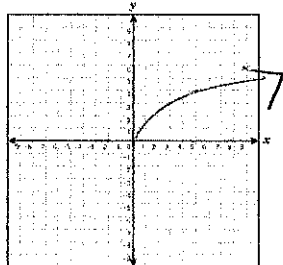
Exponential Functions: $y = a(b)^x$

Graph looks like:



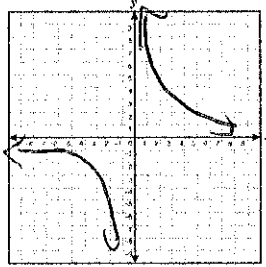
Square root functions: $y = \sqrt{x}$

Graph looks like:



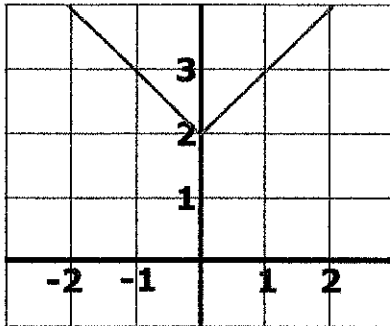
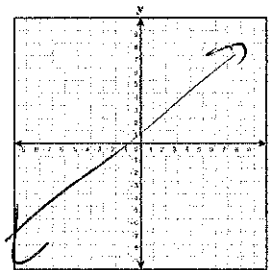
Rational functions: $y = \frac{a}{x}$

Graph looks like:



Linear functions: $y = ax + b$ (or $y = mx + b$)

Graph looks like:



14. this graph is created from which rule?

A. $y = |x + 2|$

B. $y = |x - 2|$

C. $y = |x| + 2$

D. $y = -|x| + 2$

Examine each of the following tables. Name the family of functions to which each belong. If the function is quadratic or absolute value, also state whether the graph opens up or down.

Linear, Exponential, rational, quadratic (up), quadratic (down), absolute value (up), absolute value (down)

15.

x	-2	-1	0	1	2
y	.25	.5	1	2	4

exponential →
starts small/decimals,
increases quickly.

* symmetry in table
(non-linear/constant)

16. Quadratic \rightarrow up * has a minimum / low point
so opens up

x	-2	-1	0	1	2
y	16	4	0	4	16

17. Absolute value \rightarrow up * linear symmetry in table

x	-2	-1	0	1	2
y	6	5	4	5	6

* has a minimum / low point

\checkmark -1 \checkmark -1 \checkmark 1 \checkmark 1

18. linear

x	-2	-1	0	1	2
y	6	2	-2	-6	-10

\checkmark -4 \checkmark -4 \checkmark -4 \checkmark -4

19. Rational

x	-2	-1	0	1	2
y	-2.5	-5	Error	5	2.5

20. absolute value \rightarrow down * linear symmetry
* has a maximum / high point

x	-2	-1	0	1	2
y	1	2	3	2	1

21. quadratic \rightarrow down

+ non-linear symmetry,
+ has a maximum / high point

x	-2	-1	0	1	2
y	-12	-3	0	-3	-12

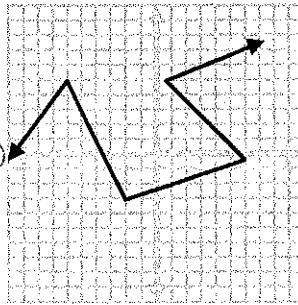
$\underbrace{\hspace{1.5cm}}_9$ $\underbrace{\hspace{1.5cm}}_3$ $\underbrace{\hspace{1.5cm}}_{-3}$ $\underbrace{\hspace{1.5cm}}_{-9}$

23.

Domain $\mathbb{R}, (-\infty, \infty) -\infty < x < \infty$

Range $\mathbb{R}, (-\infty, \infty) -\infty < y < \infty$

Function? NO

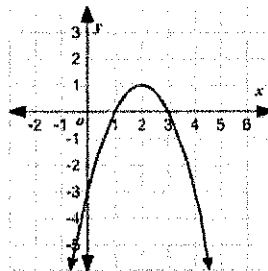


24.

Domain $\mathbb{R}, (-\infty, \infty) -\infty < x < \infty$

Range $-\infty < y \leq 1$ $(-\infty, 1]$

Function? YES



25. $\{(-4, 6), (-2, 10), (-4, 3), (0, 10), (2, -4)\}$

Domain $\{-4, -2, 0, 2\}$

Range $\{-4, 3, 6, 10\}$

Function? NO

(input of -4 has two outputs)

26. $\{(-4, 6), (-2, 6), (0, 3), (0, 10), (2, 6)\}$

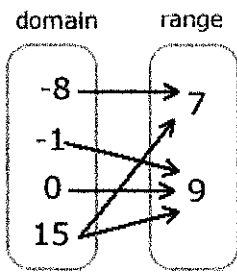
Domain $\{-4, -2, 0, 2\}$

Range $\{3, 6, 10\}$

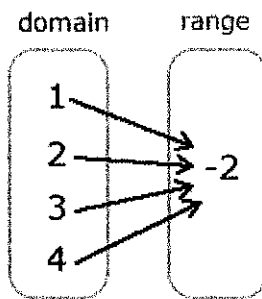
Function? NO

(input of 0 has two outputs)

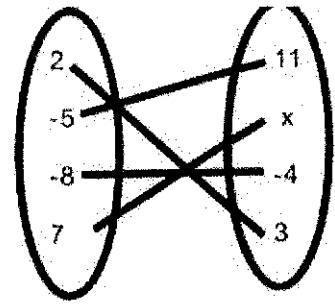
27.

Domain $\{-8, -1, 0, 15\}$ Range $\{7, 9\}$ Function? no

28.

Domain $\{1, 2, 3, 4\}$ Range $\{-2\}$ Function? yes

29.

Domain $\{-8, -5, 2, 7\}$ Range $\{-4, 3, 11, x\}$ Function? yes

Explain how you knew which mapping diagram was not a function.

The input 15 has 2 outputs

Write a function rule for each table of values:

30.

x	f(x)
-2	7
-1	4
0	1
1	-2

$f(x) = -3x + 1$

31.

x	f(x)
-4	8
-2	4
0	0
2	-4

$f(x) = -2x$

32.

x	f(x)
-4	-2
-2	0
0	2
2	4

$f(x) = x + 2$