

### Advanced Algebra Unit 1 Practice SWIG

To receive full credit for the corrections, you must show all work and answer any additional questions.

1. Which of the following tables is a function?

A.

X	Y
5	1
4	2
3	3
4	4
5	5

B.

X	Y
2	0
2	0
2	1
2	2
2	2

C.

X	Y
5	1
4	2
3	3
2	4
1	5

D.

X	Y
1	1
1	2
1	3
1	2
1	1

How do you know the table you chose IS a function?

Different elements of the DOMAIN (x-values or coordinates) must match up with exactly one element of the RANGE (y-values or coordinates)

2. Which of the following is not a function?

A.

Hour	Class
1 <sup>st</sup>	Math
2 <sup>nd</sup>	English
3 <sup>rd</sup>	P.E.
4 <sup>th</sup>	History
5 <sup>th</sup>	Lunch
6 <sup>th</sup>	Science

B.

Month	Avg. Temp
January	15° F
March	40° F
May	65° F
July	95° F

C.

Grade	Class
A	Math
B	English
A	P.E.
C	History
D	Science

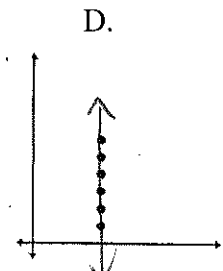
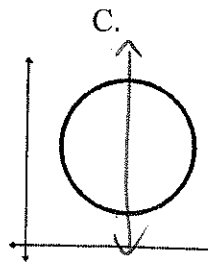
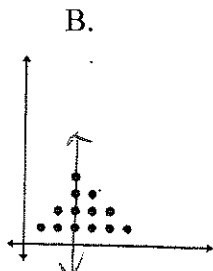
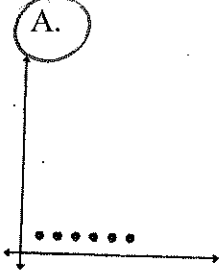
D.

Day	Weather
Monday	Sunny
Tuesday	Cloudy
Wednesday	Cloudy
Thursday	Raining
Friday	Sunny

How do you know the table you chose is NOT a function?

Because the DOMAIN (Grade A) matches up with TWO (not 1) elements of the RANGE (Math and P.E.).

3. Which of the following is a function?

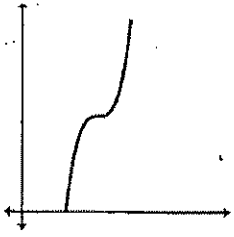


How do you know the graph you chose IS a function?

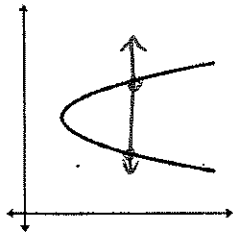
Vertical line test ensures whether a graph is a function or not. Graphs B, C, and D fail the vertical line test.

4. Which of the following is not a function?

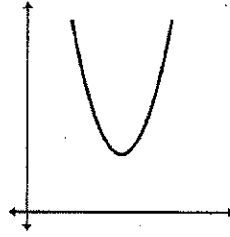
A.



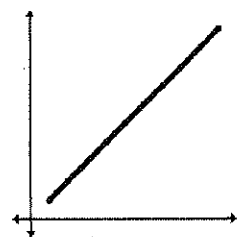
B.



C.



D.



How do you know the graph you chose is NOT a function?

Graph B fails the vertical line test.

5. If  $f(x) = 4x + 2$ , what is  $f(3)$ ?

$$\begin{aligned} f(3) &= 4(3) + 2 \\ &= 12 + 2 \\ &= \boxed{14} \end{aligned}$$

6. If  $h(x) = \frac{x+6}{3}$ , what is  $h(15)$ ?

$$\begin{aligned} h(15) &= \frac{(15)+6}{3} \\ &= \frac{21}{3} \\ &= \boxed{7} \end{aligned}$$

7. If  $g(x) = x^2 + 3x + 5$ , what is  $g(-3)$ ?

$$\begin{aligned} g(-3) &= (-3)^2 + 3(-3) + 5 \\ &= 9 - 9 + 5 \\ &= 0 + 5 \\ &= \boxed{5} \end{aligned}$$

$\underbrace{-3 \cdot -3}_{9}$

8. If  $f(x) = \frac{1}{4}x + 7$ , what is  $f(12)$ ?

$$\begin{aligned} f(12) &= \frac{1}{4}(12) + 7 \\ &= 3 + 7 \\ &= \boxed{10} \end{aligned}$$

showed how to use calculator to check ans.

Side work:

$$\begin{aligned} \frac{1}{4} \cdot \frac{12}{1} \\ &= \frac{12}{4} \\ &= 3 \end{aligned}$$

9. Solve the formula,  $P = 2L + 2W$ , for  $W$ .

$$\begin{aligned} P &= 2L + 2W \\ -2L \quad -2L \\ \hline \frac{P-2L}{2} &= \frac{2W}{2} \quad \text{or} \quad \boxed{\frac{P-2L}{2} = W} \\ \boxed{\frac{P}{2} - L} &= W \end{aligned}$$

10. Solve the formula,  $F = \frac{9}{5}C + 32$ , for  $C$ .

$$\begin{aligned} F &= \frac{9}{5}C + 32 \\ -32 \quad -32 \\ \hline F-32 &= \frac{9}{5}C \quad \text{Now multiply both sides by 5.} \\ 5 \cdot F - 5 \cdot 32 &= 5 \cdot \frac{9}{5}C \\ \frac{5F-160}{9} &= \frac{9C}{9} \Rightarrow \boxed{\frac{5F-160}{9} = C} \quad \text{or} \quad \boxed{\frac{5F-160}{9} = C} \end{aligned}$$

11. Solve the formula,  $A = p + prt$ , for  $t$ .

$$\begin{aligned} A &= p + prt \\ -p \quad -p \\ \hline \frac{A-p}{pr} &= \frac{prt}{pr} \\ \boxed{\frac{A-p}{pr} - \frac{1}{r}} &= t \quad \text{or} \quad \boxed{\frac{A-p}{pr} = t} \end{aligned}$$

12. Solve the formula,  $A = \frac{1}{2}h(b_1 + b_2)$ , for  $h$ .

Multiply both sides by 2.

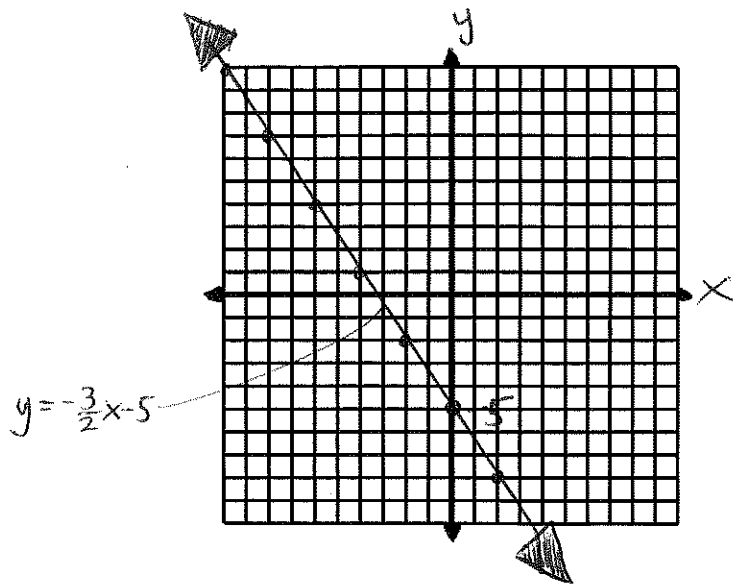
$$\begin{aligned} 2 \cdot A &= 2 \cdot \frac{1}{2}h(b_1 + b_2) \\ 2A &= h(b_1 + b_2) \\ \frac{2A}{b_1 + b_2} &= \frac{h(b_1 + b_2)}{b_1 + b_2} \\ \boxed{\frac{2A}{b_1 + b_2} = h} \end{aligned}$$

13. Graph  $y = -\frac{3}{2}x - 5$ .

Slope: # in front of  $x$

$$\frac{-3 \downarrow}{2 \rightarrow}$$

y-intercept:  $-5$



14. Find the inverse of  $f(x) = 2x + 6$ .

step 1:  $y = 2x + 6$

step 2:  $x = 2y + 6$

step 3: Solve for  $y$  in step 2.

$$\begin{aligned} x &= 2y + 6 \\ -6 & \quad -6 \\ \hline \frac{x-6}{2} &= \frac{2y}{2} \implies \boxed{\frac{1}{2}x - 3} = y \end{aligned}$$

step 4:  $f^{-1}(x) = \frac{1}{2}x - 3$  ✓

15. Find the inverse of  $f(x) = \frac{1}{3}x - 2$ .

step 1:  $y = \frac{1}{3}x - 2$

step 2:  $x = \frac{1}{3}y - 2$

step 3:  $x = \frac{1}{3}y - 2$ , for  $y$ .

$$\begin{aligned} x + 2 &= \frac{1}{3}y && \text{Multiply by 3 to all terms} \\ 3 \cdot x + 3 \cdot 2 &= 3 \cdot \frac{1}{3}y \\ \boxed{3x + 6} &= y \end{aligned}$$

step 4:  $f^{-1}(x) = 3x + 6$  ✓

16. Graph the inverse of  $f(x) = x + 4$ .

First, find the inverse.

step 1:  $y = x + 4$

step 2:  $x = y + 4$

step 3:  $x = y + 4$

$$\boxed{x - 4} = y$$

step 4:  $f^{-1}(x) = x - 4$ . Now graph.

Slope:  $\frac{1 \uparrow}{1 \rightarrow}$  y-intercept:  $-4$

