Name:_____ Block:___

Quiz: Unit3. Relations, Functions
Chapter 3

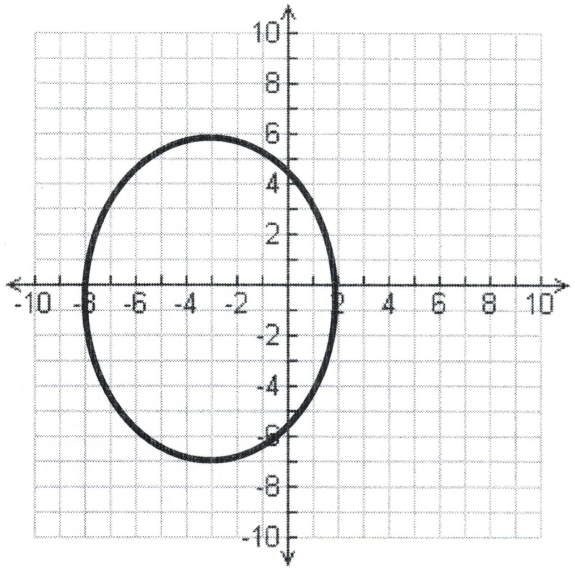
Group A.

Practice

There are 5 questions in this quiz, each of equal value.
Standard time for the test is 15 minutes .
No calculator is allowed. (accommodation excepted)

Question 1:
For each of the following, determine the Domain, Range, and for the Type choose the most specific name from the following list: "Relation", "Function", or "1-to-1 function".

a.

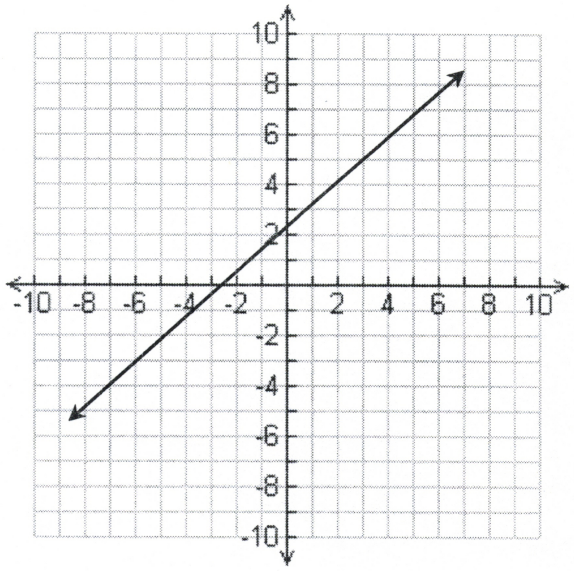


Domain: $[-8, 2]$

Range: $[-7, 6]$

Type: Relation

b.

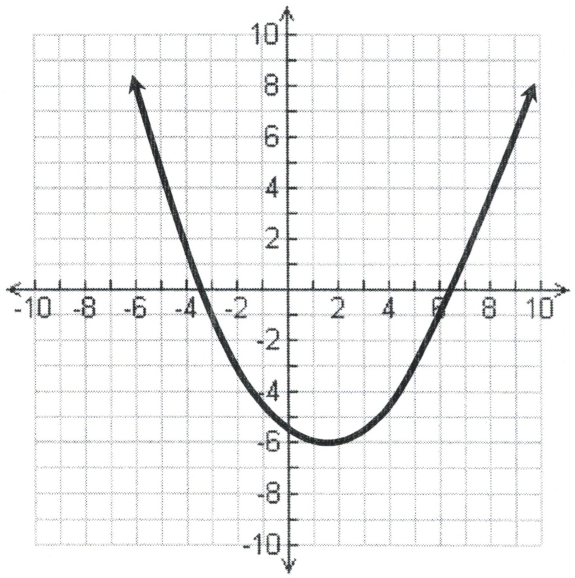


Domain: $(-\infty, +\infty)$

Range: $(-\infty, +\infty)$

Type: 1-to-1 function

c.

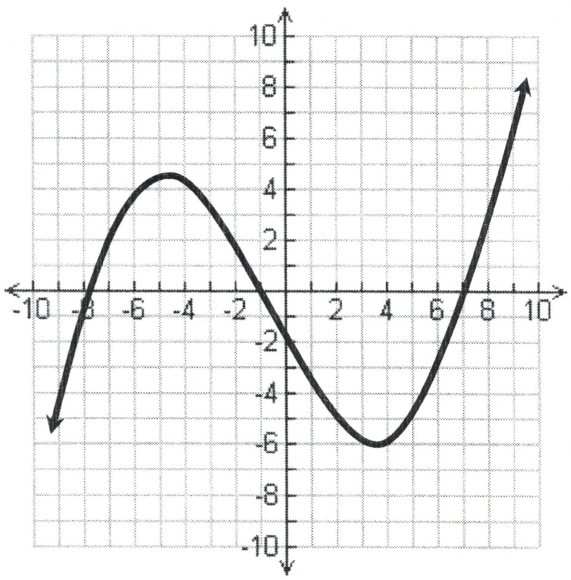


Domain: $(-\infty, +\infty)$

Range: $[-6, \infty)$

Type: Function

d.



Domain: $(-\infty, +\infty)$

Range: $(-\infty, +\infty)$

Type: Function

Question 2:

Given the following definitions:

$f(x) = 2x + 5$, $g(x) = x^2 - 3$, $h(x) = |7 - x|$

Find the following:

a) $f(3)$ $= 2 \cdot 3 + 5 = \boxed{11}$

b) $g(-1)$ $= (-1)^2 - 3 = 1 - 3 = \boxed{-2}$

Should be 14-9 = 5

c) $(h+f)(-7)$ $= h(-7) + f(-7) = \underbrace{|7-(-7)|}_{h(-7)} + \underbrace{2\cdot(-7)+5}_{f(-7)} = 14 + 9 = \boxed{23}$

d) $f(h(8))$ $= f(|7-8|) = f(|-1|) = f(1) = \underbrace{2 \cdot 1 + 5}_{f(1)} = \boxed{7}$

Question 3:

Given the following definitions:
$f(x) = 3x + 2$, $g(x) = x^2$, $h(x) = |x - 2|$

Find the following:

a) $f(2x+1)$ $= 3 \cdot (2x+1) + 2 = 6x + 3 + 2 = \boxed{6x + 5}$

b) $h(2x+1)$ $= |(2x+1) - 2| = \boxed{|2x - 1|}$

c) $(h \circ g)(x)$ $= h(x^2) = \boxed{|x^2 - 2|}$ ($g(x)$)

d) $(h \circ f)(x)$ $= h(3x+2) = |3x + 2 - 2| = \boxed{|3x|}$ ($f(x)$)

Question 4:

In a parking garage the sign says:

1. First 2hrs (or part thereof) : $18
2. Every additional hour over (or part thereof) : $5

Assuming you will park for at least 3 hours (and possibly more), express your final cost as a combination of the following functions (you can use all the operations we learned in class on functions)

$f(x) = x - 2$, $g(x) = 5x$, $h(x) = 18$

Explain your reasoning in not more than 3 sentences.

Assume that the number of hours is given as an integer.

Final Cost $= \boxed{h(x) + (g \circ f)(x)}$

$= 18 + 5 \cdot (x-2)$

You pay $18 fixed. Then, number of additional hours is $(x-2)$, and you pay $5 for each.

Question 5a:

Simplify the following expressions so ~~they~~ it includes only positive exponents.

$$\left(\frac{y^2 \cdot 5}{25 \cdot y^{-3}}\right)^2$$

$\left(\frac{y^2}{y^{-3}}\right)^2 \cdot \left(\frac{5}{25}\right)^2 = y^{10} \cdot \frac{1}{25} =$

$= \boxed{\frac{y^{10}}{25}}$

Question 5b:

Solve the equation $A - P = Prt$, for P.

$A = P + Prt$

$A = P(1 + rt)$

$\boxed{\frac{A}{1+rt} = P}$

=== End ====