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## Inverse Functions Practice

## Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. A pre-paid cellular phone charges $\$ 25$ for activation and $\$ 0.05$ per minute. The relation of cost to minutes can be defined by the function $c(x)=0.05 x+25$. What is the inverse of the function?
a. $f^{-1}(x)=-20 x+500$
b. $f^{-1}(x)=\frac{20}{x}+\frac{1}{25}$
c. $f^{-1}(x)=-0.05 x-25$
d. $f^{-1}(x)=20 x-500$
2. Which of the following is the inverse relation to the set of ordered pairs $\{(-10,5),(-7,9),(0,6),(8,-12)\}$ ?
a. $\{(5,-10),(9,-7),(6,0),(-12,8)\}$
b. $\{(-10,-5),(-7,-9),(0,-6),(8,12)\}$
c. $\{(10,-5),(7,-9),(0,-6),(-8,12)\}$
d. $\{(-5,10),(-9,7),(-6,0),(12,-8)\}$
$\qquad$ 3. Which of the following is the inverse to the function "Multiply by 8 , then subtract 10 "?
a. Add 10 , then divide by 8
c. Divide by 8 , then add 10
b. Subtract 10 , then multiply by 8
d. Multiply by 10 , then subtract 8
3. Which of the following is the inverse to the function $f(x)=-8-5 x_{\text {? }}$ ?
a. $f^{-1}(x)=-\frac{1}{5 x}-\frac{1}{8}$
b. $f^{-1}(x)=\frac{x}{5}+\frac{8}{5}$
c. $f^{-1}(x)=-\frac{x}{5}-\frac{8}{5}$
d. $f^{-1}(x)=5 x+8$
4. A graph of a function is shown.


Which of the following is the graph of the inverse?
a.

c.

b.

d.

$\qquad$ 6. The Drama Club is holding a car wash to raise money. The club spent $\$ 90$ on materials and supplies. The club earns $\$ 11.25$ for each car they wash. Which of the following is the inverse to the function of how much the club earns per cars washed?
a. $f^{-1}(x)=-\frac{x}{11.25}+8$
b. $f^{-1}(x)=\frac{x}{11.25}+8$
c. $f^{-1}(x)=-11.25 x+90$
d. $f^{-1}(x)=\frac{1}{11.25 x}-\frac{1}{90}$
$\qquad$ 7. Which of the following is the inverse relation to the set of ordered pairs $\{(-7,15),(0,-16),(5,9),(17,-8)\}$ ?
a. $\{(7,-15),(0,16),(-5,-9),(-17,8)\}$
b. $\{(-7,-15),(0,16),(5,-9),(17,8)\}$
c. $\{(-15,7),(16,0),(-9,-5),(8,-17)\}$
d. $\{(15,-7),(-16,0),(9,5),(-8,17)\}$
8. Which of the following is the inverse to the function "Divide by 2 , then add 21 "?
a. Add 21, then divide by 2
c. Divide by 21 , then add 2
b. Subtract 21 , then multiply by 2
d. Multiply by 2 , then subtract 21

## Short Answer

9. What is the inverse of the linear function $f(x)=-10+8 x_{\text {? }}$ ?
10. For $h(t)=-6 t+7$, determine $h^{h^{-1}(4)}$.
11. Use the graph of the function to draw the graph of the inverse.


Is the inverse a function?
12. A DVD rental company charges $\$ 7$ per month plus $\$ 2.50$ for each rental. The relation can be defined by $c(x)=2.5 x+7$. Determine the inverse of the function and what it represents.
13. What is the inverse of the linear function $f(x)=\frac{2}{3} x-6$ ?
14. For $g(x)=4-9 x$, determine $g^{-1}(-3)$.
15. Use the graph of the function to draw the graph of the inverse.


Is the inverse a function?
16. Ms. Wright wrote the function $p(x)=82 x-2700$ to represent her profits from purses sold. Determine the inverse of the function and what it represents.
17. What is the inverse of the linear function $h(x)=\frac{x+7}{4}$ ?
18. For $k(x)=\frac{4}{5} x-6$, determine $k^{-1}(8)$.

## Problem

19. The formula for converting a temperature in degrees Fahrenheit into degrees Celsius is $C=\frac{5}{9}(F-32)$ a) Write the formula in function notation.
b) Write $f^{-1}$ as a rule. What does the rule represent?
c) Use the inverse function to convert $9^{\circ} \mathrm{C}$ into degrees Fahrenheit.

Worksheet: Introduction to Inverse Functions
Answer Section

## MULTIPLE CHOICE

1. ANS: D

PTS: 1
REF: Application
OBJ: 1.5 - The Inverse Function and Its Properties
2. ANS: A PTS: 1 REF: Knowledge and Understanding

OBJ: 1.5-The Inverse Function and Its Properties
3. ANS: A PTS: 1 REF: Application

OBJ: 1.5-The Inverse Function and Its Properties
4. ANS: C

PTS: 1
REF: Knowledge and Understanding
OBJ: 1.5 - The Inverse Function and Its Properties
5. ANS: B PTS: 1 REF: Application

OBJ: 1.5 - The Inverse Function and Its Properties
6. ANS: B PTS: 1 REF: Application

OBJ: 1.5-The Inverse Function and Its Properties
7. ANS: D PTS: 1 REF: Knowledge and Understanding OBJ: 1.5-The Inverse Function and Its Properties
8. ANS: B

PTS: 1
REF: Application
OBJ: 1.5-The Inverse Function and Its Properties

## SHORT ANSWER

9. ANS:
$f(x)=\frac{x}{8}+\frac{5}{4}$

PTS: 1 REF: Knowledge and Understanding
OBJ: 1.5-The Inverse Function and Its Properties
10. ANS:
$h^{-1}(4)=\frac{1}{2}$

PTS: 1 REF: Application OBJ: 1.5-The Inverse Function and Its Properties
11. ANS:


Yes, the inverse is a function.
PTS: 1 REF: Thinking OBJ: 1.5 - The Inverse Function and Its Properties
12. ANS:
$c^{-1}(x)=\frac{x}{2.5}-\frac{7}{2.5}$ or $c^{-1}(x)=0.4 x-2.8$; the inverse represents the rentals as a function of cost
PTS: 1 REF: Thinking OBJ: 1.5 - The Inverse Function and Its Properties
13. ANS:
$f^{-1}(x)=\frac{3}{2} x+9$
PTS: 1
REF: Knowledge and Understanding
OBJ: 1.5 - The Inverse Function and Its Properties
14. ANS:
$g^{-1}(-3)=\frac{7}{9}$
PTS: 1 REF: Application OBJ: 1.5 - The Inverse Function and Its Properties
15. ANS:


No, the graph of the inverse is not a function.

PTS: 1 REF: Thinking OBJ: 1.5 - The Inverse Function and Its Properties
16. ANS:
$p^{-1}(x)=\frac{x}{82}+\frac{1350}{41}$; the inverse represents the purses sold as a function of profits
PTS: 1 REF: Thinking OBJ: 1.5 - The Inverse Function and Its Properties
17. ANS:
$h(x)=4 x-7$

PTS: 1
REF: Knowledge and Understanding
OBJ: 1.5 - The Inverse Function and Its Properties
18. ANS:
$k^{-1}(8)=17 \frac{1}{2}$

PTS: 1 REF: Application OBJ: 1.5-The Inverse Function and Its Properties

## PROBLEM

19. ANS:
a) $f(x)=\frac{5}{9}(x-32)$
b) $f^{-1}(x)=\frac{9}{5} x+32$
; the inverse represents the formula to convert degrees Celsius to degrees Fahrenheit c) $48.2{ }^{\circ} \mathrm{F}$

PTS: 1 REF: Communication
OBJ: 1.5 - The Inverse Function and Its Properties

