## Class Name : Lacoste College Algebra Spring 2020 CRN22385 MW3

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Instructor Name : Prof. Lacoste

Instructor Note : All Practice Problems for Exam 2. There are multiple versions so that you can try challenging problems more than once. Contact me if you need even more versions.

## Question 1 of 47

Calculate the distance between the points $H=(2,-5)$ and $P=(7,-8)$ in the coordinate plane.
Give an exact answer (not a decimal approximation).


## Question 2 of 47

Find the midpoint $M$ of the line segment joining the points $S=(-7,8)$ and $T=(-1,-6)$.


## Question 3 of 47

Fill in the blank with a number to make the expression a perfect square.

$$
x^{2}+12 x+\square
$$

## Question 4 of 47

The equation of a circle is given below. Identify the center and radius. Then graph the circle.

$$
(x-5)^{2}+(y+3)^{2}=16
$$

Center: ( $\qquad$ , $\qquad$
Radius: $\qquad$


## Question 5 of 47

The equation of a circle is given below. Identify the radius and the center. Then graph the circle

$$
x^{2}+y^{2}-8 x+4 y+4=0
$$

Radius: $\qquad$
Center: $\qquad$ , _


## Question 6 of 47

The equation of a circle is given below. Identify the center and the radius. Then graph the circle.

$$
4 x^{2}+4 y^{2}+24 x-24 y+23=0
$$

Radius: $\qquad$
Center: $\qquad$ , $\qquad$


## Question 7 of 47

Give the equation of the circle centered at the origin and passing through the point $(0,-6)$.

## Question 8 of 47

Write an equation of the circle with center $(-9,6)$ and radius 3 .

## Question 9 of 47

Find an equation of the circle that has center $(-6,4)$ and passes through $(-4,-6)$.

## Question 10 of 47

Find an equation of the circle whose diameter has endpoints $(-5,-1)$ and $(1,5)$.

## Question 11 of 47

The graph of a function is given below.
Give all $x$-intercepts and $y$-intercepts shown.


If there is more than one answer, separate them with commas.
$x$-intercept(s):
$y$-intercept(s):

## Question 12 of 47

For each relation, decide whether or not it is a function.


Domain Range

$\{(r, f),(t, r),(f, f),(u, r)\}$
$\{(8, d),(0, d),(-9, d),(-1, d)\}$

## Question 13 of 47

For each graph below, state whether it represents a function.
Function?

## Question 14 of 47

The functions $f$ and $g$ are defined as follows.

$$
f(x)=-3 x^{3}-2 \quad g(x)=-3 x+2
$$

Find $f(-3)$ and $g(6)$.
Simplify your answers as much as possible.

## Question 15 of 47

The function $g$ is defined as follows.

$$
g(x)=\frac{x^{2}-3 x-10}{x^{2}-14 x+45}
$$

Find $g(6)$.
Simplify your answer as much as possible.

## Question 16 of 47

The functions $f, g$, and $h$ are defined as follows.

$$
f(x)=1+\sqrt{x-5} \quad g(x)=\frac{x^{2}+3}{7+x} \quad h(x)=|-13+6 x|
$$

Find $f(8), g(5)$, and $h\left(\frac{3}{2}\right)$.
Simplify your answers as much as possible.

## Question 17 of 47

The function $f$ is defined by $f(x)=x^{2}-6$.
Find $f(4 x)$.

## Question 18 of 47

The function $h$ is defined as $h(x)=\frac{6}{5 x^{2}-3 x}$.
Find $h(x+1)$.
Write your answer without parentheses, and simplify it as much as possible.

$$
h(x+1)=
$$

## Question 19 of 47

Suppose that the relation $H$ is defined as follows.

$$
H=\{(-8,9),(-5,-5),(1,-2),(-2,0)\}
$$

Give the domain and range of $H$.
Write your answers using set notation.

## Question 20 of 47

The function $h$ is defined below.

$$
h(x)=\frac{x+9}{x^{2}-9}
$$

Find all values of $x$ that are NOT in the domain of $h$.
If there is more than one value, separate them with commas.

## Question 21 of 47

The functions $f$ and $g$ are defined as follows.

$$
\begin{aligned}
& f(x)=\frac{x+9}{x^{2}-81} \\
& g(x)=\frac{x^{2}}{x+6}
\end{aligned}
$$

For each function, find the domain.
Write each answer as an interval or union of intervals.

## Question 22 of 47

Find the domain of the function.

$$
u(x)=\sqrt{4-x}
$$

Write your answer using interval notation.

## Question 23 of 47

Find the domain of the function.

$$
f(x)=\frac{\sqrt{x+2}}{-x+10}
$$

Write your answer as an interval or union of intervals.

## Question 24 of 47

For each of the following equations, determine whether $y$ is a function of $x$.

| $y=2 x+6$ | Function | Not a function <br> $y^{2}=-3 x$ |
| :---: | :--- | :--- |
| $y=9 x$ | Function | Not a function |
| $y=\frac{\bigcirc}{5} x^{2}$ | Function | Not a function |
|  | Function | Not a function |

## Question 25 of 47

For each of the following, determine whether the equation defines $y$ as a function of $x$.

| $3 x=y^{3}$ | Function | Not a function |
| :---: | :---: | :---: |
| $36=\|y\|+x^{2}$ | 0 <br> Function | 0 <br> Not a function |
| $36+y^{2}=x^{2}$ | Function | Not a function |
| $y=3\|x\|-4$ | 0 <br> Function | 0 <br> Not a function |

## Question 26 of 47

Amy rented a truck for one day. There was a base fee of $\$ 8.00$, and there was an additional charge of 6 cents for each mile driven. The total cost, $C$ (in dollars), for driving $x$ miles is given by the following function.

$$
C(x)=8.00+0.06 x
$$

What is the total rental cost if Amy drove 50 miles?

## Question 27 of 47

A construction crew needs to pave a road that is 204 miles long. The crew paves 8 miles of the road each day. The length, $L$ (in miles), that is left to be paved after $d$ days is given by the following function.

$$
L(d)=204-8 d
$$

Answer the following questions.
(a) How many miles of the road does the crew have left to pave after 13 days?
$\square$ miles
(b) If 148 miles of the road is left to be paved, how many days has the crew been paving the road?

$$
\square \text { days }
$$

## Question 28 of 47

The graph of a function $f$ is shown below.
Find $f(-2)$.


## Question 29 of 47

The graph of a function $f$ is shown below.
Find one value of $x$ for which $f(x)=4$ and find $f(-2)$.


## Question 30 of 47

The graph of the relation $H$ is shown below.


Give the domain and range of $H$.
Write your answers using set notation.

## Question 31 of 47

The entire graph of the function $f$ is shown in the figure below.
Write the domain and range of $f$ using interval notation.


## Question 32 of 47

The entire graph of the function $g$ is shown in the figure below.
Write the domain and range of $g$ as intervals or unions of intervals.


## Question 33 of 47

The graph of a quadratic function with vertex $(4,-3)$ is shown in the figure below.
Find the domain and the range.


Write the domain and range using interval notation.

$$
\begin{aligned}
& \text { domain }= \\
& \text { range }= \\
& \hline
\end{aligned}
$$

## Question 34 of 47

Graph the line $x=1$.


## Question 35 of 47

Find an equation for the line below.


## Question 36 of 47

Write equations for the horizontal and vertical lines passing through the point $(3,-1)$. horizontal line:
vertical line:

## Question 37 of 47

Find the average rate of change of $g(x)=-2 x^{2}+8$ from $x=3$ to $x=8$.
Simplify your answer as much as possible.

## Question 38 of 47

The graph of a function $f$ is shown below.
Use the graph of the function to find its average rate of change from $x=5$ to $x=7$.
Simplify your answer as much as possible.


## Question 39 of 47

Keiko is driving a racecar. The table below gives the distance $D(t)$ (in meters) she has driven at a few times $t$ (in seconds) after she starts.

| Time $t$ <br> (seconds) | Distance $D(t)$ <br> (meters) |
| :---: | :---: |
| 0 | 0 |
| 3 | 78.3 |
| 4 | 147.6 |
| 6 | 185.4 |
| 9 | 287.1 |

(a) Find the average rate of change for the distance driven from 0 seconds to 3 seconds.
___ meters per second
(b) Find the average rate of change for the distance driven from 4 seconds to 9 seconds.
___ meters per second

## Question 40 of 47

A line passes through the point $(6,-2)$ and has a slope of $-\frac{4}{3}$.

Write an equation in point-slope form for this line.

## Question 41 of 47

Write an equation of the line below.


## Question 42 of 47

The equations of three lines are given below.
Line 1: $y=\frac{5}{2} x+8$
Line 2: $4 x+10 y=4$
Line 3: $2 y=5 x+3$
For each pair of lines, determine whether they are parallel, perpendicular, or neither.

| Line 1 and Line 2: | $\circ$ Parallel | $\circ$ Perpendicular | $\circ$ Neither |
| :--- | :--- | :--- | :--- | :--- |
| Line 1 and Line 3: | $\circ$ Parallel | $\circ$ Perpendicular | $\circ$ Neither |
| Line 2 and Line 3: | $\circ$ Parallel | $\circ$ Perpendicular | $\circ$ Neither |

## Question 43 of 47

Consider the line $y=-\frac{2}{3} x-2$.
(a) Find the equation of the line that is parallel to this line and passes through the point $(8,-3)$.
(b) Find the equation of the line that is perpendicular to this line and passes through the point $(8,-3)$.

## Question 44 of 47

Owners of a recreation area are filling a small pond with water. They are adding water at a rate of 30 liters per minute. There are 600 liters in the pond to start.

Let $W$ represent the amount of water in the pond (in liters), and let $T$ represent the number of minutes that water has been added. Write an equation relating $W$ to $T$, and then graph your equation using the axes below.


## Question 45 of 47

At a candy factory, a machine is putting candy into a container. The graph shows the amount of candy (in pounds) in the container versus time (in minutes).


Time (minutes)
(a) What is the amount of candy in the container at 0 minutes?
$\qquad$ pounds
(b) Choose the statement that best describes how the time and amount of candy are related. Then fill in the blank.

O As time increases, the amount of candy in the container decreases.

At what rate is the amount of candy decreasing?
$\qquad$ pounds per minute

O As time increases, the amount of candy in the container increases.

At what rate is the amount of candy increasing?
$\qquad$ pounds per minute

## Question 46 of 47

The credit remaining on a phone card (in dollars) is a linear function of the total calling time made with the card (in minutes). The remaining credit after 31 minutes of calls is $\$ 25.97$, and the remaining credit after 55 minutes of calls is $\$ 22.85$. What is the remaining credit after 57 minutes of calls?

Remaining
$\begin{aligned} & \text { credit } \\ & \text { (in dollars) }\end{aligned}$

\[

\]

## Question 47 of 47

Lucy will rent a car for a day. The rental company offers two pricing options: Option A and Option B. For each pricing option, cost (in dollars) depends on miles driven, as shown below.

Cost (in dollars)


Miles driven
(a) If Lucy drives the rental car 250 miles, which option costs more?
○ Option A
○ Option B

How much more does it cost than the other option?
\$ $\qquad$
(b) For what number of miles driven do the two options cost the same?

If Lucy drives less than this amount, which option costs more?
O Option A O Option B

# Exam 2 Practice Problems \#1 Answers for class Lacoste College Algebra Spring 2020 - CRN22385 MW3 

## Question 1 of 47

Distance: $\sqrt{34}$

Question 2 of 47
$M=(-4,1)$

Question 3 of 47
$x^{2}+12 x+36$

Question 4 of 47
Center: $(5,-3)$
Radius: 4


Question 5 of 47

Radius: 4
Center: $(4,-2)$


## Question 6 of 47

Center: $(-3,3)$
Radius: $\frac{7}{2}$


## Question 7 of 47

$x^{2}+y^{2}=36$

## Question 8 of 47

$(x+9)^{2}+(y-6)^{2}=9$

## Question 9 of 47

$(x+6)^{2}+(y-4)^{2}=104$

## Question 10 of 47

$(x+2)^{2}+(y-2)^{2}=18$

## Question 11 of 47

(a) $\quad x$-intercept(s): $-2,2$
(b) $\quad y$-intercept(s): -4

## Question 12 of 47



## Question 13 of 47



## Question 14 of 47

$$
\begin{aligned}
f(-3) & =79 \\
g(6) & =-16
\end{aligned}
$$

## Question 15 of 47

$g(6)=-\frac{8}{3}$

## Question 16 of 47

$$
\begin{aligned}
& f(8)=1+\sqrt{3} \\
& g(5)=\frac{7}{3}
\end{aligned}
$$

$h\left(\frac{3}{2}\right)=4$

## Question 17 of 47

$f(4 x)=16 x^{2}-6$

## Question 18 of 47

$h(x+1)=\frac{6}{5 x^{2}+7 x+2}$

## Question 19 of 47

$$
\begin{aligned}
& \text { domain }=\{-8,-5,1,-2\} \\
& \text { range }=\{9,-5,-2,0\}
\end{aligned}
$$

Question 20 of 47
$x=-3,3$

## Question 21 of 47

Domain of $f:(-\infty,-9) \cup(-9,9) \cup(9, \infty)$
Domain of $g:(-\infty,-6) \cup(-6, \infty)$

Question 22 of 47
$(-\infty, 4]$

Question 23 of 47
$[-2,10) \cup(10, \infty)$

## Question 24 of 47

| $y=2 x+6$ | © <br> Function | Not a function |
| :---: | :---: | :---: |
| $y^{2}=-3 x$ | 0 Function | Not a function |
| $y=9 x$ | © <br> Function | Not a function |
| $y=\frac{3}{5} x^{2}$ | © <br> Function | Not a function |

## Question 25 of 47

| $3 x=y^{3}$ | Function | Not a function |
| :---: | :---: | :---: |
| $36=\|y\|+x^{2}$ | 0 Function | © <br> Not a function |
| $36+y^{2}=x^{2}$ | Function | © <br> Not a function |
| $y=3\|x\|-4$ | © <br> Function | 0 <br> Not a function |

## Question 26 of 47

### 11.00 dollars

## Question 27 of 47

(a) How many miles of the road does the crew have left to pave after 13 days?

## 100 miles

(b) If 148 miles of the road is left to be paved, how many days has the crew been paving the road?

```
7 days
```


## Question 28 of 47

$f(-2)=1$

## Question 29 of 47

(a) One value of $x$ for which $f(x)=4: 0$
(b) $f(-2)=2$

## Question 30 of 47

$$
\begin{aligned}
& \text { domain }=\{3,-2,0,4\} \\
& \text { range }=\{3,4,-2,2\}
\end{aligned}
$$

## Question 31 of 47

(a) domain $=[-4,3)$
(b) range $=(-3,4]$

## Question 32 of 47

$$
\begin{aligned}
& \text { domain }=(-4,-2) \cup[0,5] \\
& \text { range }=[-3,4]
\end{aligned}
$$

## Question 33 of 47

domain: $(-\infty, \infty)$
range: $(-\infty,-3]$

Question 34 of 47


Question 35 of 47
$y=\frac{4}{3} x-\frac{14}{3}$

## Question 36 of 47

horizontal line: $y=-1$
vertical line: $x=3$

Question 37 of 47
$-22$

Question 38 of 47
2

Question 39 of 47
(a) Find the average rate of change for the distance driven from 0 seconds to 3 seconds.
26.1 meters per second
(b) Find the average rate of change for the distance driven from 4 seconds to 9 seconds.
27.9 meters per second

## Question 40 of 47

$y+2=-\frac{4}{3}(x-6)$

## Question 41 of 47

$y=-\frac{1}{2} x-2$

## Question 42 of 47

| Line 1 and Line 2: | Parallel | © Perpendicular | O Neither |
| :---: | :---: | :---: | :---: |
| Line 1 and Line 3: | Parallel | O Perpendicular | O Neither |
| Line 2 and Line 3 : | O Parallel | © Perpendicular | O Neither |

## Question 43 of 47

Equation of parallel line: $\quad y=-\frac{2}{3} x+\frac{7}{3}$
Equation of perpendicular line: $y=\frac{3}{2} x-15$

## Question 44 of 47

$W=600+30 T$


## Question 45 of 47

(a) What is the amount of candy in the container at 0 minutes?

## 120 pounds

(b) Choose the statement that best describes how the time and amount of candy are related. Then fill in the blank.

0
As time increases, the amount of candy in the container decreases.

At what rate is the amount of candy decreasing?
pounds per minute
©
As time increases, the amount of candy in the container increases.

At what rate is the amount of candy increasing?

80 pounds per minute

## Question 46 of 47

## \$22.59

## Question 47 of 47

(a) If Lucy drives the rental car 250 miles, which option costs more?

- Option A O Option B

How much more does it cost than the other option?
\$10
(b) For what number of miles driven do the two options cost the same?

150
If Lucy drives less than this amount, which option costs more?
○ Option A © Option B

