PRECALCULUS SUMMER MATH PACKET

The purpose of this packet is to help you review the essential prerequisite skills needed for success in Precalculus. The topics included should already be familiar from earlier math courses. If you find any content unfamiliar, you are encouraged to use online resources to review and strengthen your understanding.

These assignments are **optional but strongly encouraged**. At the beginning of the school year, you will take ***an assessment*** based on this material. ***The assessment will count for 5% of your first semester grade.***

Suggested Completion Schedule:

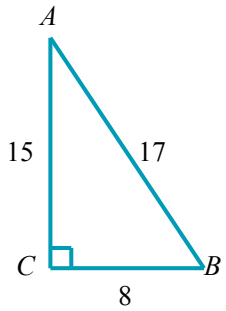
Due Date	Assignment Range	Approximate Time
Sunday, 6/15	#1–19	up to 3 hours
Sunday, 7/6	#20–39	up to 3 hours
Sunday, 7/27	#40–59	up to 3 hours

Student Name: _____ Class Name: **Algebra II 24-25**

Number of Questions: **59** Instructor Name: **Bricker, Tatyana**

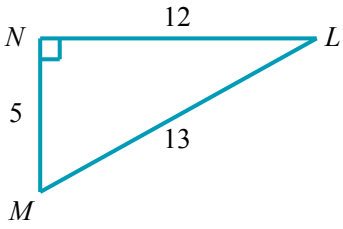
Question 1 of 59

A right triangle has side lengths 8, 15, and 17 as shown below.
Use these lengths to find $\sin A$, $\tan A$, and $\cos A$.



Question 2 of 59

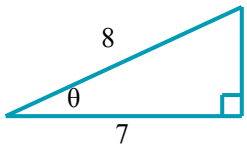
A right triangle has side lengths 5, 12, and 13 as shown below.
Use these lengths to find $\tan M$, $\cos M$, and $\sin M$.



Question 3 of 59

Find $\tan\theta$, where θ is the angle shown.

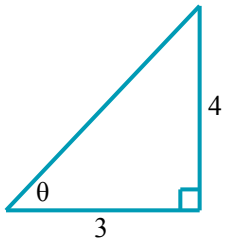
Give an exact value, not a decimal approximation.



Question 4 of 59

Find $\cos\theta$, where θ is the angle shown.

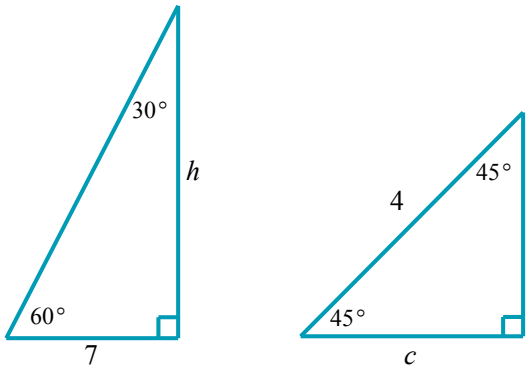
Give an exact value, not a decimal approximation.



Question 5 of 59

For the right triangles below, find the exact values of the side lengths h and c.

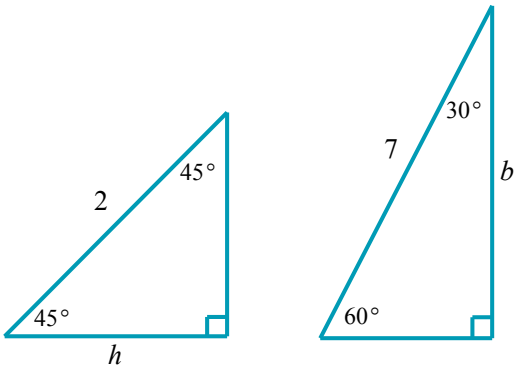
If necessary, write your responses in simplified radical form.



Question 6 of 59

For the right triangles below, find the exact values of the side lengths h and b.

If necessary, write your responses in simplified radical form.



Question 7 of 59

Simplify.

$$\frac{4u^2-16u}{7u^2-28u}$$

Question 8 of 59

Find all excluded values for the expression.
That is, find all values of t for which the expression is undefined.

$$\frac{t^2-4t-21}{t^2-16}$$

If there is more than one value, separate them with commas.

Question 9 of 59

Jane the trainer has two solo workout plans that she offers her clients: Plan A and Plan B. Each client does either one or the other (not both). On Wednesday there were 5 clients who did Plan A and 3 who did Plan B. On Thursday there were 2 clients who did Plan A and 6 who did Plan B. Jane trained her Wednesday clients for a total of 10 hours and her Thursday clients for a total of 10 hours. How long does each of the workout plans last?

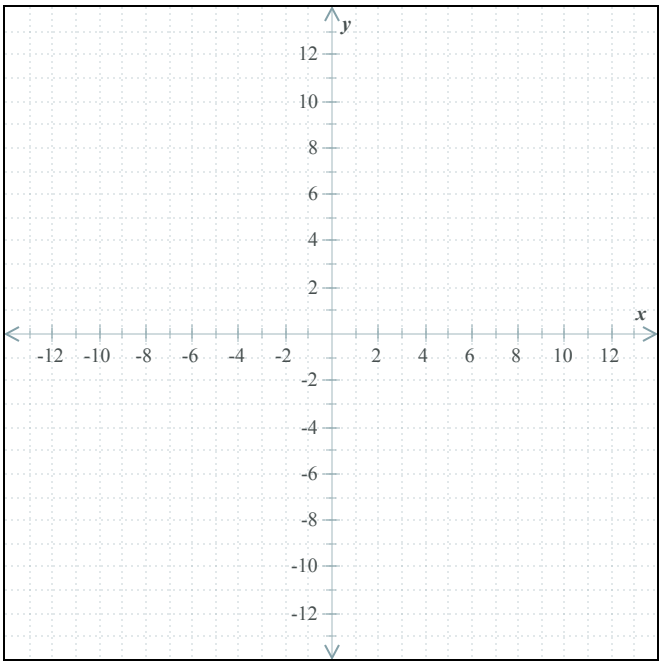
Question 10 of 59

Find the x-intercept(s) and the coordinates of the vertex for the parabola $y=x^2-2x+1$. If there is more than one x-intercept, separate them with commas.

Question 11 of 59

Graph the parabola.

$$y=-2(x+5)^2+1$$

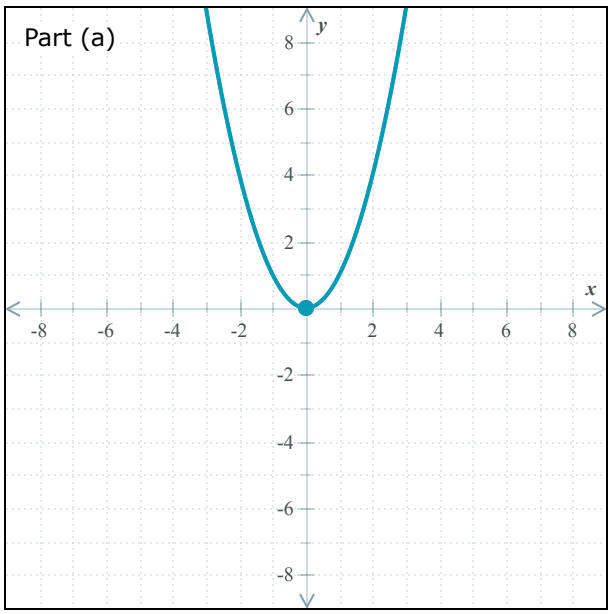


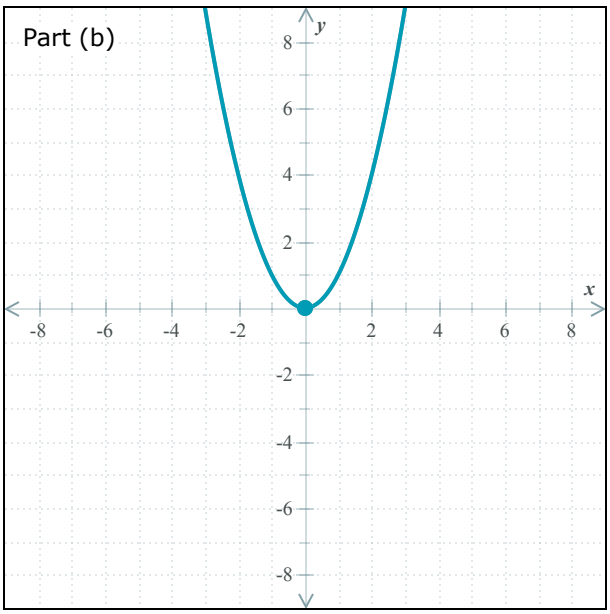
Question 12 of 59

Translate each graph as specified below.

(a) The graph of $y=x^2$ is shown. Translate it to get the graph of $y=(x-5)^2$.

(b) The graph of $y=x^2$ is shown. Translate it to get the graph of $y=x^2+2$.

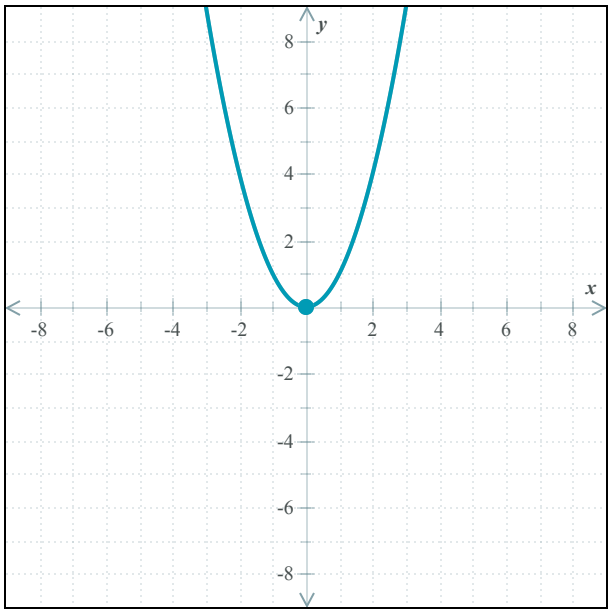




Question 13 of 59

Below is the graph of $y=x^2$.

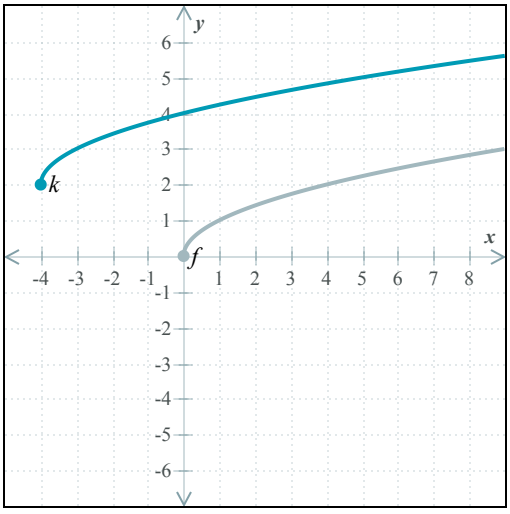
Translate it to make it the graph of $y=(x+2)^2+4$.



Question 14 of 59

The graph of f is translated a whole number of units horizontally and vertically to obtain the graph of k.

The function f is defined by $f(x)=\sqrt{x}$.
Write down the expression for $k(x)$.



$k(x)=$ _____

Question 15 of 59

Rewrite the following without an exponent.

$$10^{-2}$$

Question 16 of 59

Multiply.

$$-u^4\left(-5u^4\right)$$

Simplify your answer as much as possible.

Question 17 of 59

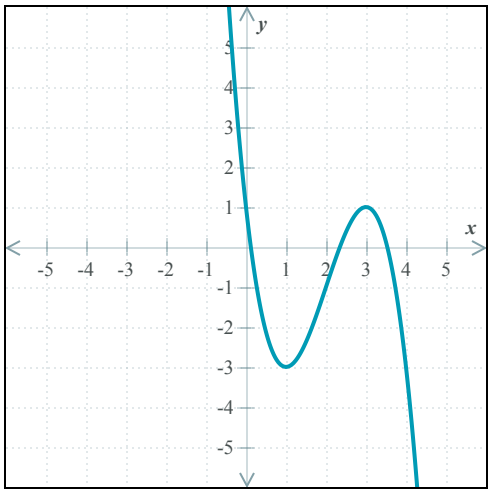
The function h is defined by $h\left(x\right)=x^2+3$.

Find $h\left(2a\right)$.

Question 18 of 59

The graph of a function f is shown below.

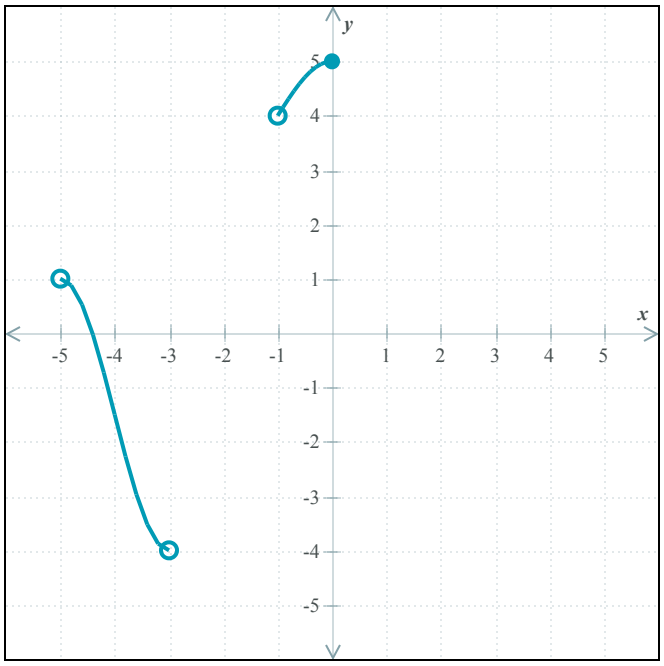
Find one value of x for which $f\left(x\right)=1$ and find $f\left(2\right)$.



Question 19 of 59

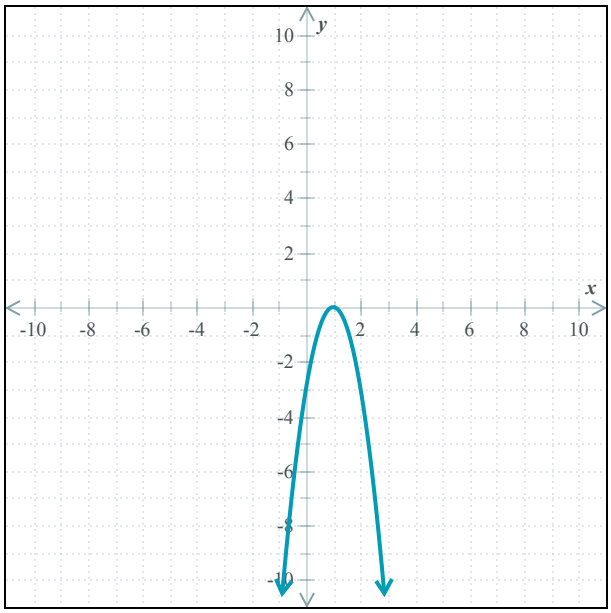
The entire graph of the function g is shown in the figure below.

Write the domain and range of g as intervals or unions of intervals.



Question 20 of 59

The graph of a quadratic function with vertex $(1, 0)$ is shown in the figure below.
Find the range and the domain.



range: _____

domain: _____

Question 21 of 59

Find all the zeros of the quadratic function.

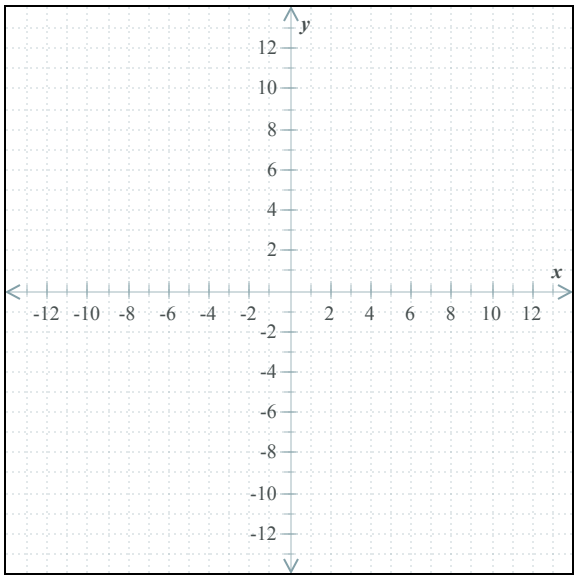
$$y = x^2 + 4x - 21$$

If there is more than one zero, separate them with commas.

Question 22 of 59

Graph the parabola.

$$y = x^2 - 10x + 21$$



Question 23 of 59

Use the quadratic formula to solve for x.

$$4x^2 - 2x - 1 = 0$$

Question 24 of 59

Simplify.

$$\sqrt{18}$$

Question 25 of 59

Simplify.

$$\sqrt{50}$$

Question 26 of 59

Graph the set $\{x \mid -4 \leq x < 2\}$ on the number line.
Then, write the set using interval notation.

Question 27 of 59

Graph the set $\{x \mid x > 5\}$ on the number line.
Then, write the set using interval notation.

Question 28 of 59

Rationalize the denominator and simplify.

$$\sqrt{\frac{6}{5}}$$

Question 29 of 59

Rationalize the denominator and simplify.

$$\frac{\sqrt{7}}{\sqrt{2}}$$

Question 30 of 59

Simplify.

$$\sqrt{32} + 5\sqrt{50}$$

Question 31 of 59

Simplify.

$$-\sqrt{27} - 5\sqrt{12}$$

Question 32 of 59

Simplify.

$$\frac{-30+5\sqrt{3}}{35}$$

Question 33 of 59

Simplify.

$$\frac{30-\sqrt{50}}{5}$$

Question 34 of 59

Simplify.

$$\sqrt{3y^5v^2}\sqrt{15y^3v^3}$$

Assume that all variables represent positive real numbers.

Question 35 of 59

Multiply.

$$2u^5 \cdot 3w^7u^4 \cdot 5w$$

Simplify your answer as much as possible.

Question 36 of 59

Rewrite the following without an exponent.

$$\left(\frac{9}{8}\right)^{-1}$$

Question 37 of 59

Rewrite the expression without using a negative exponent.

$$\frac{1}{-2y^{-4}}$$

Simplify your answer as much as possible.

Question 38 of 59

Simplify.

$$\frac{p^{9}}{p^{-6}}$$

Write your answer with a positive exponent only.

Question 39 of 59

Simplify.

$$y^{2} \cdot y^{-5} \cdot y$$

Write your answer with a positive exponent only.

Question 40 of 59

Rewrite the expression without using a negative exponent.

$$-6m^{-2}$$

Simplify your answer as much as possible.

Question 41 of 59

Simplify.

$$\left(\frac{3m^{-1}n^{4}}{4n^{-4}m^{-5}}\right)^{-3}$$

Write your answer using only positive exponents.

Question 42 of 59

For each function below, choose the correct description of its graph.

	vertical line	horizontal line	line with a negative slope	line with a positive slope	parabola opening down	parabola opening up
(a) $h(x)=-4x^{2}+1$	○	○	○	○	○	○
(b) $k(x)=2x-1$	○	○	○	○	○	○
(c) $f(x)=3$	○	○	○	○	○	○

Question 43 of 59

Solve.

$$(7-v)(5v+6)=0$$

(If there is more than one solution, separate them with commas.)

Question 44 of 59

Solve for y.

$$\frac{y-1}{4y}+\frac{1}{6}=\frac{1}{y}$$

Question 45 of 59

Solve for w.

$$-\frac{6}{w-4}=-\frac{4}{3w-12}+3$$

Question 46 of 59

Solve for u.

$$6-\frac{5}{u+2}=-\frac{6}{u-2}$$

Question 47 of 59

Subtract.

$$\frac{-2}{5v^2x}-\frac{3}{4v^3x^2}$$

Simplify your answer as much as possible.

Question 48 of 59

Subtract.

$$\frac{x+8}{x+7}-\frac{x-2}{x}$$

Simplify your answer as much as possible.

Question 49 of 59

Add.

$$\frac{3}{2u^2v}+\frac{5}{8uv^3}$$

Simplify your answer as much as possible.

Question 50 of 59

Divide.

$$\frac{49x+28}{4x-32} \div \frac{7x+4}{2x-16}$$

Simplify your answer as much as possible.

Question 51 of 59

Divide.

$$\frac{9ax}{2x^5} \div \frac{3a}{8x}$$

Simplify your answer as much as possible.

Question 52 of 59

Divide.

$$\frac{10c}{12b} \div \frac{4c}{3bc}$$

Simplify your answer as much as possible.

Question 53 of 59

Solve the inequality for u.

$$20 \geq -4(2-u)+3u$$

Simplify your answer as much as possible.

Question 54 of 59

Solve the inequality for x.

$$5x-20 < -2(3-6x)$$

Simplify your answer as much as possible.

Question 55 of 59

Evaluate the following.

(a) $-625^{\frac{1}{4}} =$

(b) $-125^{\frac{1}{3}} =$

Question 56 of 59

Write the following as an exponential expression.

$\sqrt[7]{b^4}$

Question 57 of 59

Write the following as an exponential expression.

$\sqrt[8]{14^3}$

Question 58 of 59

Simplify.

$\sqrt[5]{32w^{35}}$

Assume that the variable represents a positive real number.

Question 59 of 59

Simplify.

$\sqrt[3]{125w^3}$

Assume that the variable represents a positive real number.

Class Name: **Algebra II 24-25** Number of Questions: **59**

Question 1 of 59

$\sin A = \frac{8}{17}$

$\tan A = \frac{8}{15}$

$\cos A = \frac{15}{17}$

Question 2 of 59

$\tan M = \frac{12}{5}$

$\cos M = \frac{5}{13}$

$\sin M = \frac{12}{13}$

Question 3 of 59

$\tan\theta = \frac{\sqrt{15}}{7}$

Question 4 of 59

$\cos\theta = \frac{3}{5}$

Question 5 of 59

$h = 7\sqrt{3}$

$c = 2\sqrt{2}$

Question 6 of 59

$h = \sqrt{2}$

$b = \dfrac{7\sqrt{3}}{2}$

Question 7 of 59

$\dfrac{4}{7}$

Question 8 of 59

$t = -4,\ 4$

Question 9 of 59

Length of each Plan A workout: 1.25 hour(s)

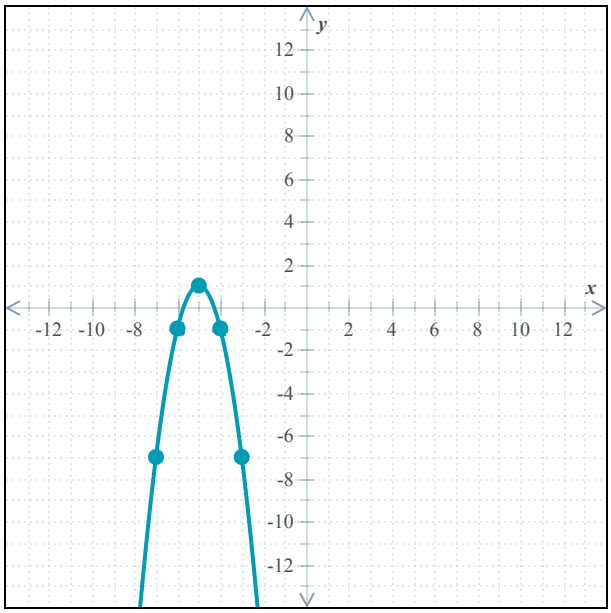
Length of each Plan B workout: 1.25 hour(s)

Question 10 of 59

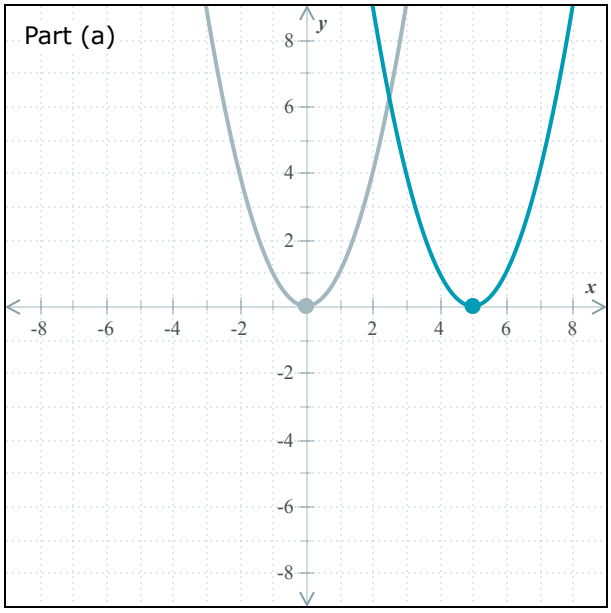
x-intercept(s): 1

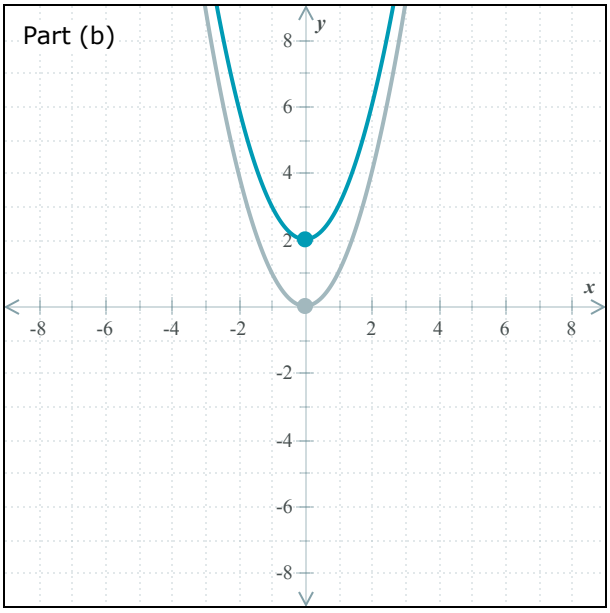
vertex: $(1,\ 0)$

Question 11 of 59

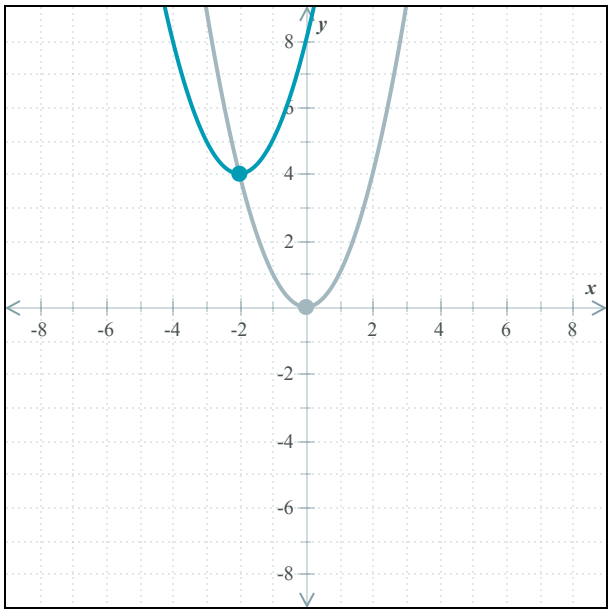


Question 12 of 59





Question 13 of 59



Question 14 of 59

$k(x) = \sqrt{x+4} + 2$

Question 15 of 59

$\frac{1}{100}$

Question 16 of 59

$5u^8$

Question 17 of 59

$h(2a) = 4a^2 + 3$

Question 18 of 59

(a) One value of x for which $f(x) = 1$: 0

(b) $f(2) = -1$

Question 19 of 59

domain $= (-5, -3) \cup (-1, 0]$

range $= (-4, 1) \cup (4, 5]$

Question 20 of 59

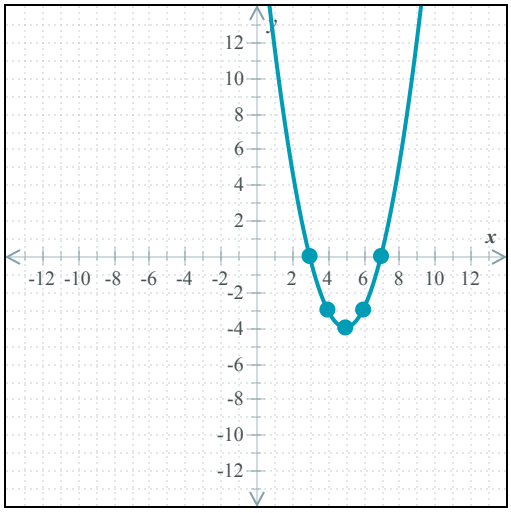
(a) range: $y \leq 0$

(b) domain: All reals

Question 21 of 59

zero(s): $3, -7$

Question 22 of 59



Question 23 of 59

An unsimplified answer is $x = \frac{2+\sqrt{20}}{8}, \frac{2-\sqrt{20}}{8}$.

A simplified answer is $x = \frac{1+\sqrt{5}}{4}, \frac{1-\sqrt{5}}{4}$.

Question 24 of 59

$3\sqrt{2}$

Question 25 of 59

$5\sqrt{2}$

Question 26 of 59

$\{x \mid -4 \le x < 2\} = [-4, 2)$

Question 27 of 59

$\{x \mid x > 5\} = (5, \infty)$

Question 28 of 59

$\frac{\sqrt{30}}{5}$

Question 29 of 59

$\frac{\sqrt{14}}{2}$

Question 30 of 59

$29\sqrt{2}$.

Question 31 of 59

$-13\sqrt{3}$.

Question 32 of 59

$\frac{-6+\sqrt{3}}{7}$

Question 33 of 59

$6-\sqrt{2}$

Question 34 of 59

$3y^4v^2\sqrt{5v}$

Question 35 of 59

$30u^9w^8$

Question 36 of 59

$\frac{8}{9}$

Question 37 of 59

$-\frac{y^4}{2}$

Question 38 of 59

p^{15}

Question 39 of 59

$\frac{1}{y^2}$

Question 40 of 59

$-\frac{6}{m^2}$

Question 41 of 59

$\frac{64}{27n^{24}m^{12}}$

Question 42 of 59

	vertical line	horizontal line	line with a negative slope	line with a positive slope	parabola opening down	parabola opening up
(a) $h(x)=-4x^2+1$	○	○	○	○	◉	○
(b) $k(x)=2x-1$	○	○	○	◉	○	○
(c) $f(x)=3$	○	◉	○	○	○	○

Question 43 of 59

$v=7\ ,\ -\frac{6}{5}$

Question 44 of 59

$y=3$

Question 45 of 59

$w=\frac{22}{9}$

Question 46 of 59

$u=\frac{1}{2}\ ,\ -\frac{2}{3}$

Question 47 of 59

$$\frac{-8vx-15}{20v^3x^2}$$

Question 48 of 59

$$\frac{3x+14}{x(x+7)}$$

Question 49 of 59

$$\frac{12v^2+5u}{8u^2v^3}$$

Question 50 of 59

$$\frac{7}{2}$$

Question 51 of 59

$$\frac{12}{x^3}$$

Question 52 of 59

$$\frac{5c}{8}$$

Question 53 of 59

$$4 \geq u$$

Question 54 of 59

$$x > -2$$

Question 55 of 59

(a) $-625^{\frac{1}{4}} = -5$

(b) $-125^{\frac{1}{3}} = -5$

Question 56 of 59

$b^{\frac{4}{7}}$

Question 57 of 59

$14^{\frac{3}{8}}$

Question 58 of 59

$2w^{7}$

Question 59 of 59

$5w$