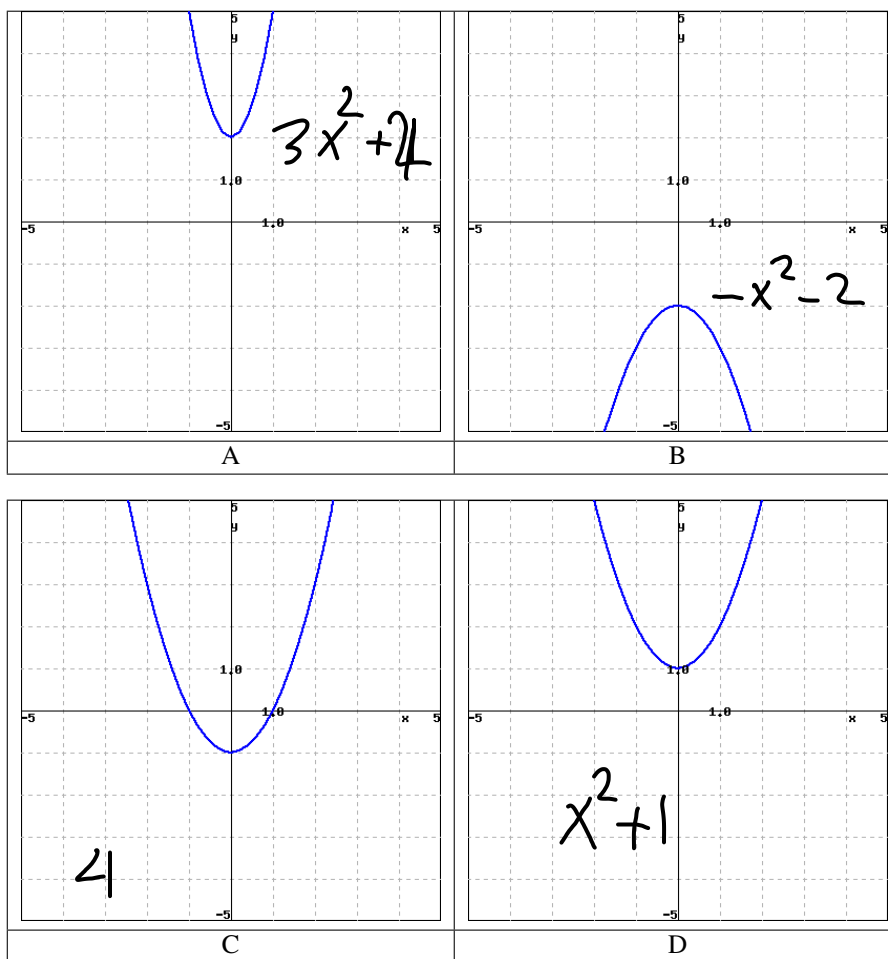**1.** (1 point)

Use properties of functions to match each of the following functions with its graph. *Do not use your calculator.* Clicking on a graph will give you an enlarged view.

$\boxed{?}$ 1. $f(x) = -x^2 - 2$

$\boxed{?}$ 2. $f(x) = 3x^2 + 2$

$\boxed{?}$ 3. $f(x) = x^2 + 1$

$\boxed{?}$ 4. $f(x) = x^2 - 1$

A

B

C

D

Answer(s) submitted:

-
-
-
-

(incorrect)

2. (1 point) Suppose that

$$f(x) = \sqrt{7x - 5} \quad \text{and} \quad g(x) = 7x^2 - 5.$$

For each function h given below, find a formula for $h(x)$ and the domain of h. Enter the domains using **interval notation**.

(A) $h(x) = (f \circ g)(x).$

$h(x) =$ _____
Domain = _____

(B) $h(x) = (g \circ f)(x)$.

$h(x) =$ _____
Domain = _____

(C) $h(x) = (f \circ f)(x)$.

$h(x) =$ _____
Domain = _____

(D) $h(x) = (g \circ g)(x)$.

$h(x) =$ _____
Domain = _____

Answer(s) submitted:

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- •
- •
- •
- •
- •
- •
- •

(incorrect)

3. (1 point) If $\cos(t) = -\frac{3}{4}$ where $\pi < t < \frac{3\pi}{2}$, find the values of the following trigonometric functions.

Note: Give exact answers, do not use decimal numbers. The answer should be a fraction or an arithmetic expression. If the answer involves a square root it should be enter as sqrt; e.g. the square root of 2 should be written as sqrt(2).

$\cos(2t) =$ _____
$\sin(2t) =$ _____
$\cos(\frac{t}{2}) =$ _____
$\sin(\frac{t}{2}) =$ _____

Answer(s) submitted:

- •
- •
- •
- •

(incorrect)

4. (1 point) Use a sum or difference formula or a half angle formula to determine the value of the trigonometric functions. Give exact answers. Do not use decimal numbers. The answer should be a fraction or an arithmetic expression. If the answer involves a square root it should be enter as sqrt; e.g. the square root of 2 should be written as sqrt(2);

$\sin(-\frac{7\pi}{12}) =$ _____
$\sin(\frac{3\pi}{8}) =$ _____
$\cos(\frac{3\pi}{8}) =$ _____
$\cos(\frac{11\pi}{8}) =$ _____

Answer(s) submitted:

- •
- •
- •
- •

(incorrect)

5. (1 point) The expressions A,B,C,D, E are left hand sides of identities. The expressions 1,2,3,4,5 are right hand side of identities. Match each of the left hand sides below with the appropriate right hand side. Enter the appropriate letter (A,B,C,D, or E) in each blank.

A. $\tan(x)$
B. $\cos(x)$
C. $\sec(x)\csc(x)$
D. $\frac{1-(\cos(x))^2}{\cos(x)}$
E. $2\sec(x)$

___1. $\sin(x)\sec(x)$
___2. $\sin(x)\tan(x)$
___3. $\tan(x)+\cot(x)$
___4. $\sec(x)-\sec(x)(\sin(x))^2$
___5. $\frac{\cos(x)}{1-\sin(x)} + \frac{1-\sin(x)}{\cos(x)}$

Answer(s) submitted:

- •
- •
- •
- •
- •

(incorrect)

6. (1 point) Questions 8-16:

Find the exact value of each without using a calculator:

a) $\tan\left(\frac{\pi}{6}\right) =$ _____
b) $\tan\left(\frac{5\pi}{4}\right) =$ _____
c) $\cot\left(\frac{\pi}{3}\right) =$ _____
d) $\sec\left(\frac{7\pi}{6}\right) =$ _____
e) $\csc\left(\frac{11\pi}{6}\right) =$ _____

Answer(s) submitted:

- •
- •

-
-
-

(incorrect)

7. (1 point)
Let α be an angle, with $0 \leq \alpha < 2\pi$. Given $\cos(2\alpha) = \frac{-47}{81}$ and 2α is in quadrant II, find exact values of the six trigonometric functions.

Note: You are not allowed to use decimals in your answer.

$\sin(\alpha) = $ _____.
$\cos(\alpha) = $ _____.
$\tan(\alpha) = $ _____.
$\csc(\alpha) = $ _____.
$\sec(\alpha) = $ _____.
$\cot(\alpha) = $ _____.

Answer(s) submitted:

-
-
-
-
-
-

(incorrect)

8. (1 point)
$$2^{2x+2} = 3^{x-43}$$

$x = $ _____

Answer(s) submitted:

-

(incorrect)

9. (1 point)

If $f(x) = e^{9x}$, $g(x) = 8x + 2$, and $h(x) = \sqrt{x}$. Find a simplified formula for the function below:

$f\big(g(x)\big)h(x) = $ _____

Answer(s) submitted:

-

(incorrect)

10. (1 point)
The population of a colony of rabbits grows exponentially. The colony begins with 5 rabbits; 5 years later there are 330 rabbits.

(a) Express the population of the colony of rabbits, P, as a function of time, t, in years.

$P(t) = $ _____

(b) Use the graph to estimate how long it takes for the population of rabbits to reach 1000 rabbits.

It will take _____ years. (round to nearest 0.01 year)

Answer(s) submitted:

-
-

(incorrect)