

PRINTABLE VERSION

Practice Final

Question 1

Find the coordinates of the y-intercept for $-5x - 9y + 6 = 0$.

- a) $(0, \frac{2}{3})$
- b) $(0, -\frac{3}{2})$
- c) $(0, -\frac{2}{3})$
- d) $(0, \frac{6}{5})$
- e) $(0, -\frac{6}{5})$
- f) None of the above

Question 2

Find the slope of the line: $7x - 4y - 3 = 0$

- a) $\frac{7}{4}$
- b) $-\frac{3}{4}$
- c) $\frac{4}{7}$
- d) $-\frac{7}{4}$
- e) $-\frac{4}{7}$
- f) None of the above

Question 3

Solve the following equation for x : $-\frac{3}{5x} + \frac{3}{35x} = 18$

- a) $-\frac{1}{15}$
- b) $\frac{1}{15}$
- c) $-\frac{1}{35}$
- d) $-\frac{7}{5}$
- e) $\frac{1}{35}$
- f) None of the above

Question 4

Paul has 12 coins in his pocket, consisting entirely of dimes and quarters. If he has a total of 240 cents in coins, how many coins of each type are in his pocket?

- a) 7 dimes and 5 quarters
- b) 8 dimes and 4 quarters
- c) 4 dimes and 8 quarters
- d) 5 dimes and 7 quarters
- e) 9 dimes and 3 quarters
- f) None of the above

Question 5

Solve the system for x :

$$6x + y = -50$$

$$3x - y = -4$$

- a) 6
- b) -6
- c) 5
- d) -8

- e) -4
- f) None of the above

Question 6

Solve the following system:

$$\begin{aligned}5x - 3y &= -4 \\ -6y + 10x &= -8\end{aligned}$$

- a) $x = \frac{40}{13}, y = \frac{84}{13}$
- b) $x = \frac{84}{13}, y = \frac{53}{13}$
- c) $x = \frac{38}{13}, y = \frac{85}{13}$
- d) Infinitely many solutions.
- e) No solution.
- f) None of the above

Question 7

Find the domain of the following function. Express the answer in interval notation.

$$f(x) = \sqrt{-9x + 8}$$

- a) $[\frac{8}{9}, \infty)$
- b) $(-\infty, \frac{8}{9})$
- c) All real numbers
- d) $(-\infty, \frac{8}{9}]$
- e) $(\frac{8}{9}, \infty)$
- f) None of the above

Question 8

Use completing the square to rewrite the equation: $x^2 + 4x - 8 = 0$

- a) $(x+2)^2 = 16$
- b) $(x-2)^2 = 16$
- c) $(x+4)^2 = 4$
- d) $(x-2)^2 = 12$
- e) $(x+2)^2 = 12$
- f) None of the above

Question 9

Solve the equation: $x^2 - 5x = 6$

- a) $x = -1, x = 8$
- b) $x = 1, x = -6$
- c) $x = 1, x = 6$
- d) $x = -1, x = 6$
- e) $x = -1, x = -6$
- f) None of the above

Question 10

Simplify the following expression and write in the form $a + bi$:

$$\frac{1 + \sqrt{-9}}{\sqrt{-81} - \sqrt{-36}}$$

- a) $\frac{1}{54} + \frac{1}{18}i$
- b) $-\frac{1}{54} - \frac{1}{18}i$
- c) $-\frac{1}{9} - \frac{1}{2}i$
- d) $\frac{1}{54} - \frac{1}{18}i$
- e) $\frac{1}{9} + \frac{1}{2}i$

f) None of the above

Question 11

Find all complex solutions to the equation: $4x^2 + 49 = 0$

a) $x = \frac{2}{7}, x = -\frac{2}{7}$

b) $x = \frac{7}{2}i, x = -\frac{7}{2}i$

c) $x = 7i, x = -7i$

d) $x = \frac{2}{7}i, x = -\frac{2}{7}i$

e) $x = \frac{7}{2}, x = -\frac{7}{2}$

f) None of the above

Question 12

Find all solutions to the following equation: $\sqrt{x+9} + 3 = x$

a) $x = 7, x = 5$

b) $x = 9, x = 3$

c) $x = 7$

d) $x = 5$

e) $x = 0, x = 7$

f) $x = 0, x = 3, x = 18$

g) None of the above

Question 13

Solve the inequality for x , given that $(x-3)^2(16-4x) > 0$

a) $(-\infty, 3) \cup (3, \infty)$

b) $(-3, 0) \cup (0, 4)$

c) $(-\infty, 3) \cup (3, 4)$

- d) $(-\infty, -3) \cup (4, \infty)$
- e) $(-3, 0) \cup (3, \infty)$
- f) None of the above

Question 14

Solve the inequality for x , given that: $\frac{3x+1}{x-5} \leq 0$

- a) $[-3, 5)$
- b) $[-\frac{1}{3}, 5)$
- c) $(-\infty, 5) \cup (5, \infty)$
- d) $[-\frac{1}{3}, 5]$
- e) $(-\infty, -\frac{1}{3}] \cup (5, \infty)$
- f) None of the above

Question 15

Solve the following inequality and give the answer in interval notation: $11 - 2|x + 3| > 7$

- a) $(-\infty, -5) \cup (-1, \infty)$
- b) $(-\infty, -\frac{34}{9}) \cup (-\frac{20}{9}, \infty)$
- c) No Solution.
- d) $(-5, -1)$
- e) $(-\frac{34}{9}, -\frac{20}{9})$
- f) None of the above

Question 16

Solve the for x : $|3x - 4| + 9 = 8$

- a) $\{\frac{13}{3}\}$

3

- b) $\{1, -1\}$
- c) $\{1, \frac{5}{3}\}$
- d) No Solution.
- e) $\{\frac{13}{3}, -\frac{13}{3}\}$
- f) None of the above

Question 17

For the function f given by

$$f(x) = -x^2 - x + 4$$

evaluate

$$\frac{f(x+h) - f(x)}{h}$$

- a) $-2x + h - 1$
- b) $-2x - h - 1$
- c) $-2x - h$
- d) $2x + h + 1$
- e) $-x - h - 1$
- f) None of the above

Question 18

Find the domain of the function $f(x) = \frac{\sqrt{x+5}}{x+6}$

- a) $[-5, -6) \quad (-6, \infty)$
- b) $[-5, \infty)$
- c) $(-6, \infty)$
- d) $(-5, -6] \quad [-6, \infty)$
- e) $(-5, \infty)$

f) None of the above

Question 19

Suppose that $y = f(x)$ is an odd function such that $(2, -3)$ is a point on the graph of f . Which of the following points belong to the graph of f ?

a) $(-3, -2)$

b) $(-2, -3)$

c) $(2, -3)$

d) $(-2, 3)$

e) $(2, 3)$

f) None of the above

Question 20

Find the vertex of the graph of

$$f(x) = 5x^2 - 40x + 94$$

a) $(4, -14)$

b) $(4, 14)$

c) $(-4, 14)$

d) $(-4, -14)$

e) $(0, 4)$

f) None of the above

Question 21

Given the following functions, find $(f \circ g)(x)$.

$$f(x) = \frac{-x + 5}{x + 5}$$

$$g(x) = x + 3$$

a) $\frac{2x + 20}{x + 5}$

$-x + 4$

- b) $\frac{-x+6}{x+6}$
- c) $\frac{-x+8}{x+8}$
- d) $\frac{-x+1}{x+1}$
- e) $\frac{-x+2}{x+8}$
- f) None of the above

Question 22

Given

$$f(x) = \frac{1}{x-8}$$

Let g be the inverse of f . Find $g(x)$.

- a) $g(x) = \frac{-8x-1}{x}$
- b) $g(x) = \frac{-8x+1}{x}$
- c) $g(x) = \frac{8x+1}{x}$
- d) $g(x) = \frac{8x-1}{x}$
- e) $g(x) = -\frac{8}{x+1}$
- f) None of the above

Question 23

What transformations are needed to go from the graph of the basic function

$$f(x) = \sqrt[3]{x}$$

to the graph of

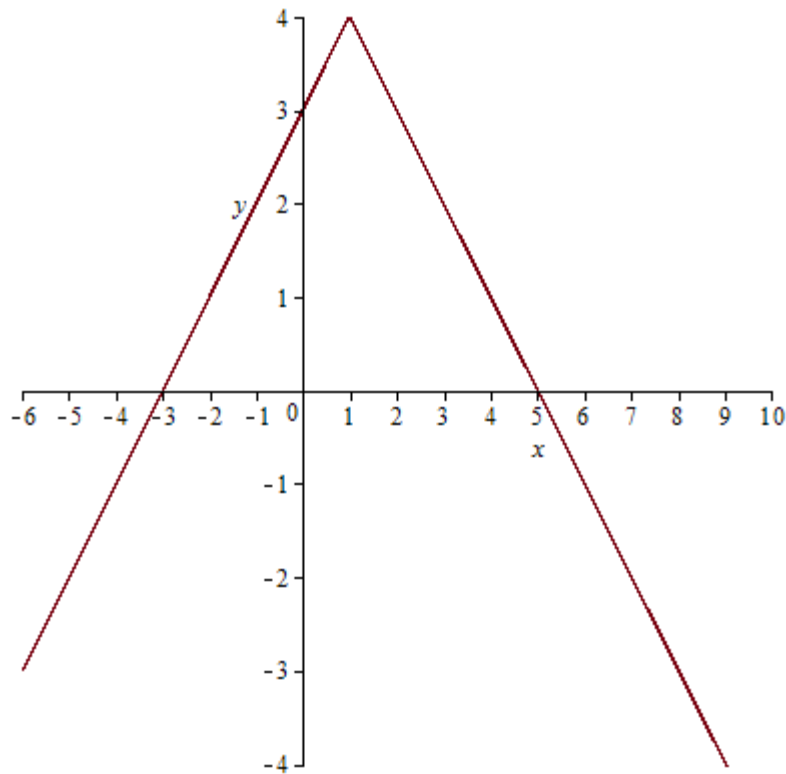
$$g(x) = \sqrt[3]{x+3} + 13$$

- a) Shift right 13 units, and shift down 3 units.
- b) Shift up 3 units.

- c) Shift left 3 units, and shift up 13 units.
- d) Shift right 3 units, and shift down 13 units.
- e) Shift up 3 units, and shift down 13 units.
- f) None of the above

Question 24

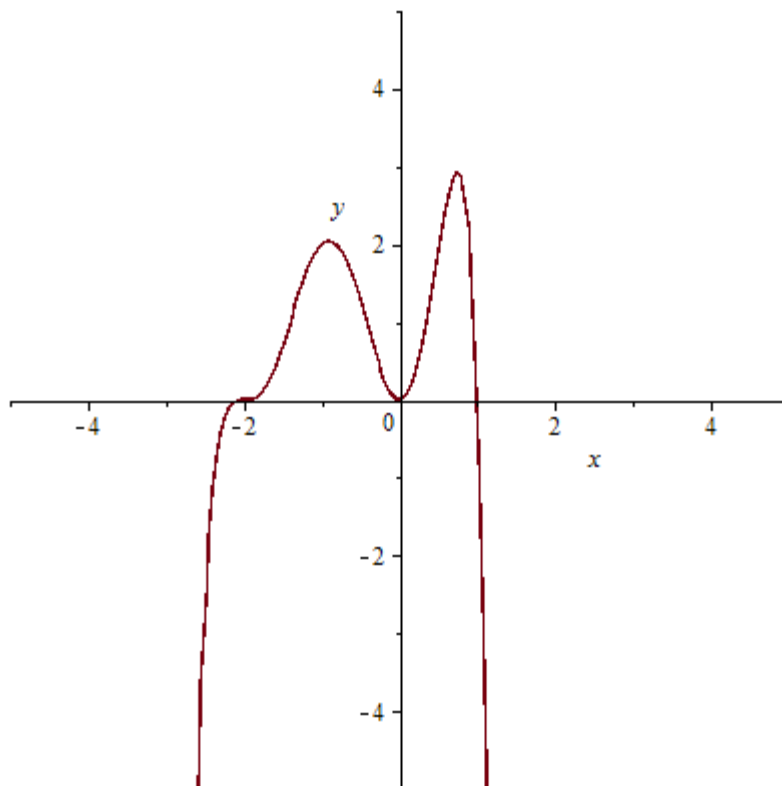
Which of the following functions matches the graph below?



- a) $f(x) = -|x - 1| + 4$
- b) $f(x) = |x - 1| - 4$
- c) $f(x) = |x + 1| + 4$
- d) $f(x) = -|x - 1| - 4$
- e) $f(x) = |x + 1| - 4$
- f) None of the above

Question 25

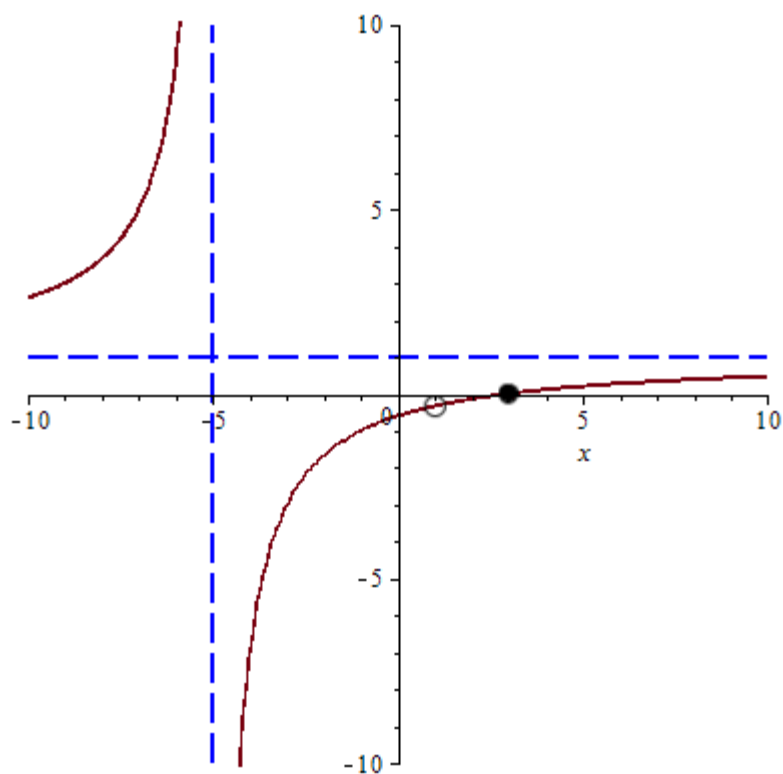
Which of the following functions could correspond to the graph below?



- a) $f(x) = -(x-1)x^2(x+2)^3$
- b) $f(x) = -(x+2)x^2(x-1)^3$
- c) $f(x) = -x(x-1)^2(x+2)^3$
- d) $f(x) = (x-1)x^2(x+2)^3$
- e) $f(x) = (x-1)(x+2)^2x^3$
- f) None of the above

Question 26

Find the function, whose graph is shown below



a) $f(x) = \frac{(x-3)(x-1)}{(x+5)(x-1)}$

b) $f(x) = \frac{(x+3)(x-1)}{(x-5)(x-1)}$

c) $f(x) = \frac{(x-3)(x+1)}{(x+5)(x-1)}$

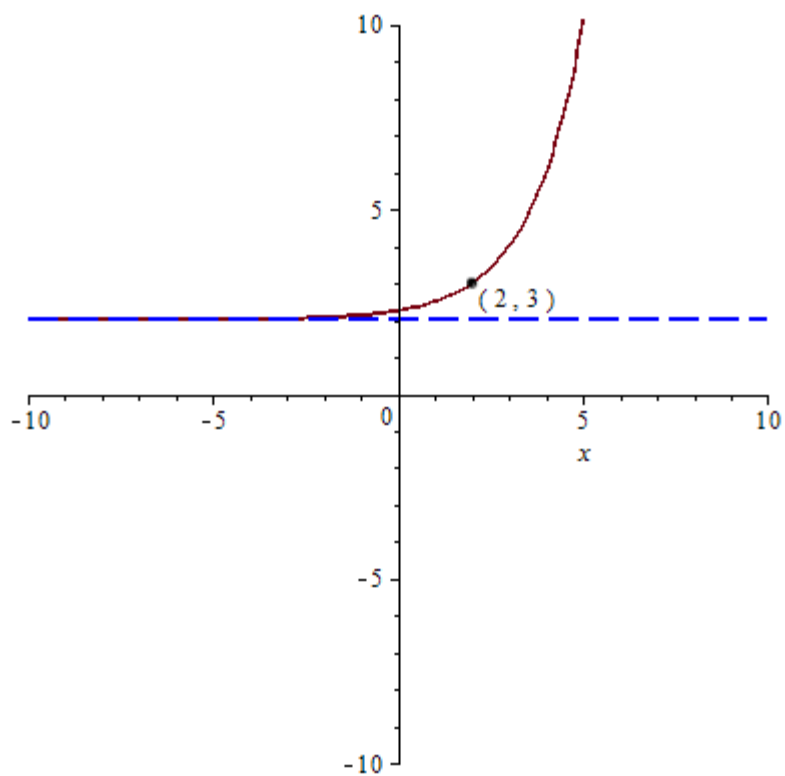
d) $f(x) = \frac{(x+3)(x+1)}{(x-5)(x+1)}$

e) $f(x) = \frac{(x-3)(x+1)}{(x+5)(x+1)}$

f) None of the above

Question 27

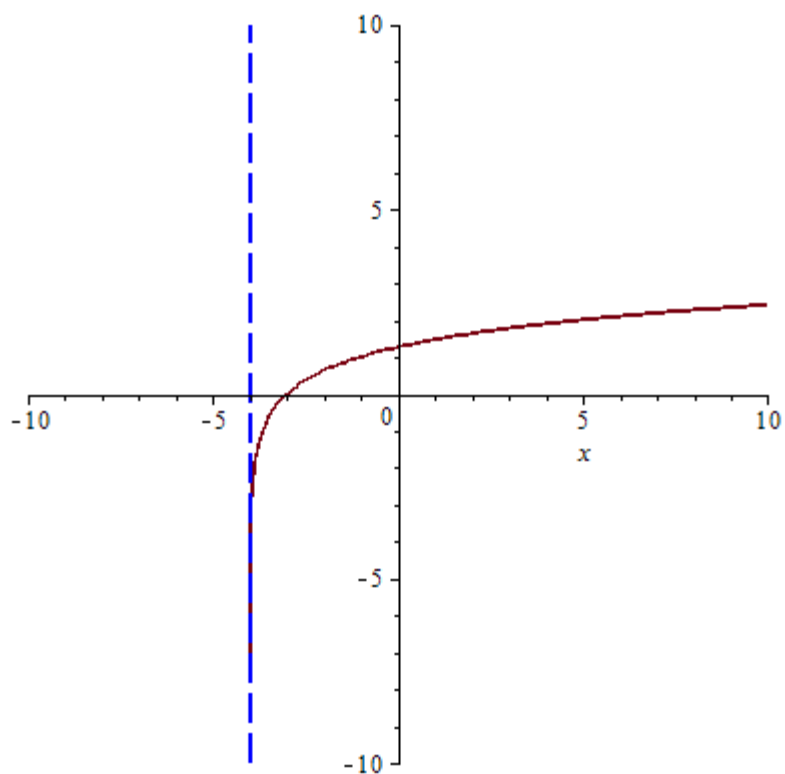
Which of the following functions corresponds to the graph?



- a) $f(x) = -2^{x-2} - 2$
- b) $f(x) = 2^{x-2} - 2$
- c) $f(x) = 2^{x+2} + 2$
- d) $f(x) = 2^{x-2} + 2$
- e) $f(x) = 2^{x+2} - 2$
- f) None of the above

Question 28

Find the function, whose graph is shown below



- a) $f(x) = \log_3(x+4)$
- b) $f(x) = \log_{-4}(x-3)$
- c) $f(x) = \log_{-4}(x+3)$
- d) $f(x) = \log_3(x-4)$
- e) $f(x) = \log_{-3}(x+4)$
- f) None of the above

Question 29

Find the asymptote of the logarithmic function

$$f(x) = \log(-3x + 8)$$

- a) $x = \frac{8}{3}$
- b) $x = -\frac{8}{3}$
- c) $y = \frac{8}{3}$
- d) $x = \frac{3}{8}$

e) $y = -\frac{8}{3}$

f) None of the above

Question 30

Find the range of

$$f(x) = -(2^{x+10}) + 6$$

a) $(-\infty, 6)$

b) $[10, \infty)$

c) $(6, \infty)$

d) $(-\infty, -6)$

e) $[-6, \infty)$

f) None of the above

Question 31

Given the polynomial

$$P(x) = (x+3)^2(x-5)^3(x-2)^4$$

, the behavior of the x -intercept $x = -3$ resembles to the shape of

a) Cubic downward from left to right

b) Parabola, upward

c) Cubic upward from left to right

d) Parabola, downward

e) Decreasing line

f) None of the above

Question 32

Find the zero(s) of the function

$$P(x) = x^3 + 4x^2 - x - 4$$

- a) -4
- b) $\{-1, 1, 4\}$
- c) $\{1, 4\}$
- d) $\{1, -4, 4\}$
- e) $\{-1, 1, -4\}$
- f) None of the above

Question 33

Find a polynomial with integer coefficients that satisfies the following conditions :

Degree of polynomial : 3
Zeros : $2, 3i$
Constant coefficient : -90

- a) $P(x) = x^3 - 10x^2 + 45x - 90$
- b) $P(x) = 3x^3 - 5x^2 + 45x - 90$
- c) $P(x) = x^3 + 10x^2 + 45x + 90$
- d) $P(x) = x^3 - 15x^2 - 45x - 90$
- e) $P(x) = 5x^3 - 10x^2 + 45x - 90$
- f) None of the above

Question 34

Find the y-intercept(s) of the function

$$f(x) = -\frac{11}{x-9}$$

- a) $\frac{11}{9}$
- b) $-\frac{11}{9}$
- c) There are no y-intercept.
- d) 11
- e) -11

f) None of the above

Question 35

Find the horizontal asymptote(s), if any, of the function

$$f(x) = \frac{5}{x-15}$$

a) $y = 15$

b) $y = 1$

c) There are no horizontal asymptotes.

d) $y = 0$

e) $y = 5$

f) None of the above

Question 36

Rewrite the following expression by using the laws of logarithms:

$$\log\left(\frac{x^8(x^2-5)^2}{\sqrt{y-5} z^8}\right)$$

a) $8\log(x) + 2\log(x^2 + -5) - \frac{1}{2}\log(y - 5) - 8\log(z)$

b) $2\log(x) + 8\log(x^2 + -5) - \frac{1}{2}\log(y - 5) - 8\log(z)$

c) $8\log(x) - 2\log(x^2 + -5) - \frac{1}{2}\log(y - 5) - 8\log(z)$

d) $8\log(x) - 2\log(x^2 - -5) + \frac{1}{2}\log(y + 5) + 8\log(z)$

e) $8\log(x) + 2\log(x^2 + -5) + \frac{1}{2}\log(y - 5) + 8\log(z)$

f) None of the above

Question 37

Rewrite the following expression as a single logarithm:

$$9\log(W) + 10\log(Z) - \frac{1}{3}\log(U) - 7\log(Q)$$

a) $\log\left(\frac{W^9 Z^{10}}{\sqrt[3]{U} + Q^7}\right)$

b) $\log\left(\frac{10W^9Z}{U^3Q^7}\right)$

c) $\log\left(\frac{Z^9W^{10}}{\sqrt[3]{UQ^7}}\right)$

d) $\log\left(\frac{9W^{10}Z}{\sqrt[3]{UQ^7}}\right)$

e) $\log\left(\frac{W^9Z^{10}}{\sqrt[3]{UQ^7}}\right)$

f) None of the above

Question 38

Simplify the following expression:

$$\log_8(192) - \log_8(24)$$

a) 3

b) -3

c) -1

d) 2

e) 1

f) None of the above

Question 39

Find all solutions to:

$$7^{x-10} = 25$$

a) $x = \frac{\log 7}{\log 25} + 10$

b) $x = \frac{\log 25}{\log 7} - 10$

c) $x = \frac{\log 25}{\log 7} + 10$

d) $x = \log \frac{25}{7} + 10$

e) $x = \frac{\log 7}{\log 25} - 10$

f) None of the above

Question 40

Solve for x :

$$\log_5(x) + \log_5(x + 1) = \log_5(20)$$

a) $x = \frac{19}{2}$

b) $x = -5$

c) $x = -5$, $x = 4$

d) $x = 5$, $x = -4$

e) $x = 4$

f) None of the above