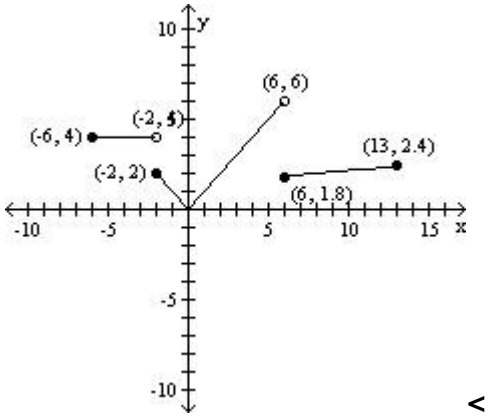
Q1. Based on the graph, find the range of y = f(x).

$$f(x) = \begin{cases} 4 & \text{if } -6 \le x < -2 \\ |x| & \text{if } -2 \le x < 6 \\ \sqrt[3]{x} & \text{if } 6 \le x \le 13 \end{cases}$$



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- a. [0, 6]
- b. [0, 6)
- c. [0, $\sqrt[3]{13}$]
- d. [0, ∞)

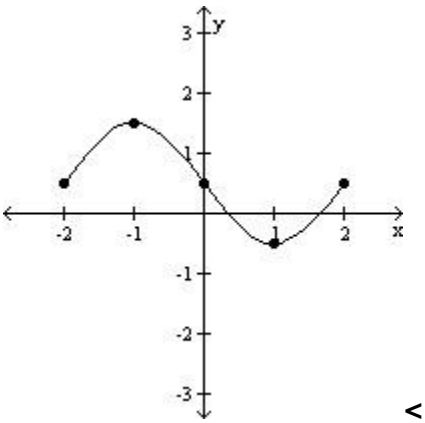
Q2. Answer the question about the given function.

Given the function $f(x) = x^2 + 3x - 40$, list the x-intercepts, if any, of the graph of f.

- a. (8, 0), (-5, 0)
- b. (8, 0), (5, 0)
- c. (-8, 0), (5, 0)
- d. (-8, 0), (1, 0)

Q3. The graph of a function is given. Determine whether the function is increasing, decreasing, or constant on the given interval.

(-2, -1)



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a. decreasing

b. increasing

c. constant

Q4. Determine whether the relation represents a function. If it is a function, state the domain and range.

$4 \rightarrow 16$
$5 \rightarrow 20$
$6 \rightarrow 24$
$7 \rightarrow 28$ **<b**

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a. function
domain:{16, 20, 24, 28}
range: {4, 5, 6, 7}

b. function
domain: {4, 5, 6, 7}
range: {16, 20, 24, 28}

c. not a function

Q5. Determine algebraically whether the function is even, odd, or neither.

f(x) = $\frac{x}{x^2+2}$

a. even

b. odd

c. neither

Q6. Match the graph to the function listed whose graph most resembles the one given.

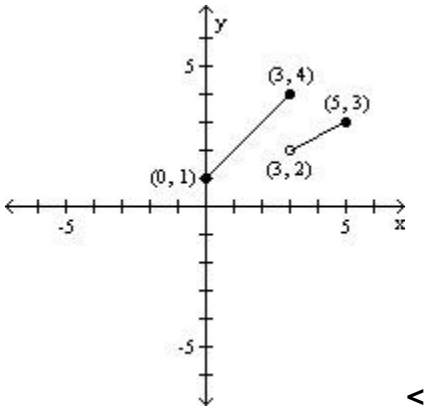
- a. square function
- b. cube function
- c. square root function
- d. cube root function

Q7. Answer the question about the given function.

Given the function $f(x) = -7x^2 + 14x + 4$, if $x = 1$, what is $f(x)$? What point is on the graph of f?

- a. 11; (1, 11)
- b. 11; (11, 1)
- c. -17; (1, -17)
- d. -17; (-17, 1)

Q8. The graph of a piecewise-defined function is given. Write a definition for the function.



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- a. $f(x) = \begin{cases} x + 1 & \text{if } 0 \le x \le 3 \\ \frac{1}{2}x + \frac{1}{2} & \text{if } 3 < x \le 5 \end{cases}$
- b. $f(x) = \begin{cases} x + 1 & \text{if } 0 \le x \le 3 \\ \frac{1}{2}x + 2 & \text{if } 3 < x \le 5 \end{cases}$
- c. $f(x) = \begin{cases} x + 1 & \text{if } 0 \le x \le 3 \\ \frac{1}{2}x & \text{if } 3 < x \le 5 \end{cases}$

d. $f(x) = \begin{cases} x + 1 & \text{if } 0 \le x \le 3 \\ \frac{1}{2}x - \frac{1}{2} & \text{if } 3 < x \le 5 \end{cases}$

Q9. Answer the question about the given function.

Given the function f(x) = $\frac{x^2 - 8}{x - 3}$, if x = -2, what is f(x)? What point is on the graph of f?

a. $\frac{4}{5}$; ($\frac{4}{5}$, -2)

b. $-\frac{12}{5}$; (-2, $-\frac{12}{5}$)

c. $-\frac{12}{5}$; ($-\frac{12}{5}$, -2)

d. $\frac{4}{5}$; (-2, $\frac{4}{5}$)

Q10. Given: E=I/R and P=IE with the values: P=10 and E=100 What are the values for I and R?

a. R=.001, I=0.1

b. R=100, I=100

c. R=0.1, I=1000

d. Cannot be solved without the value of another variable.

Q11. Find the domain of the function.

g(x) = $\frac{x}{x^2 - 64}$

a. {x|x ≠ 0}

b. {x|x > 64}

c. {x|x ≠ -8, 8}

d. all real numbers

Q12. For the given functions f and g, find the requested function and state its domain.

f(x) = 2x + 1; g(x) = 5x - 2

Find $\frac{f}{g}$.

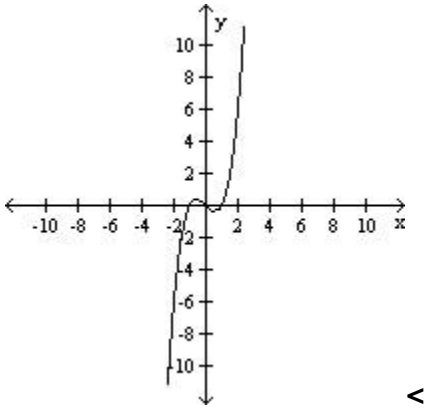
a. $(\frac{f}{g})(x) = \frac{5x - 2}{2x + 1}$; {x|x ≠ $\frac{2}{5}$}

b. $(\frac{f}{g})(x) = \frac{2x + 1}{5x - 2}$; {x|x ≠ $-\frac{1}{2}$}

c. $(\frac{f}{g})(x) = \frac{5x - 2}{2x + 1}$; {x|x ≠ $-\frac{1}{2}$}

d. $\left(\frac{f}{g}\right)(x) = \frac{2x+1}{5x-2}$; $\{x|x \neq \frac{2}{5}\}$

Q13. List the intercepts of the graph.Tell whether the graph is symmetric with respect to the x-axis, y-axis, origin, or none of these.



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a. (-1, 0), (0, 0), (1, 0); symmetric to origin, x-axis, and y-axis

b. (-1, 0), (0, 0), (1, 0); symmetric to origin

c. (-1, 0), (0, 0), (1, 0); symmetric to y-axis

d. (-1, 0), (0, 0), (1, 0); symmetric to x-axis

Q14. Find the value for the function.

Find -f(x) when $f(x) = 2x^2 - 5x + 3$.

a. $-2x^2 + 5x + 3$

b. $2x^2 + 5x + 3$

c. $-2x^2 + 5x - 3$

d. $2x^2 + 5x - 3$

Q15. Find the value for the function.

Find f(x + 1) when $f(x) = \frac{x^2-4}{x+4}$.

a. $\frac{x^2-3}{x+5}$

b. $\frac{x^2+2x-3}{x+5}$

c. $\frac{x^2+2x-3}{x-3}$

d. $\frac{x^2+2x+5}{x+5}$

Q16. Find the average rate of change for the function between the given values.

f(x) = $\frac{3}{x-2}$; from 4 to 7

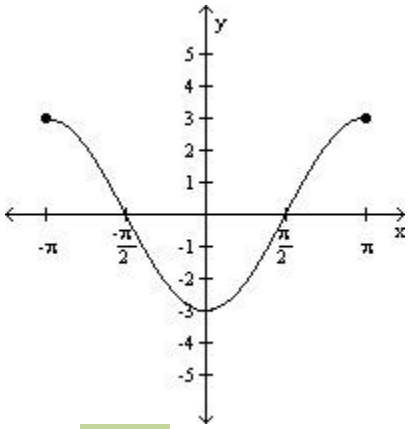
a. 7

b. $-\frac{3}{10}$

c. 2

d. $\frac{1}{3}$

Q17. The graph of a function is given. Decide whether it is even, odd, or neither.

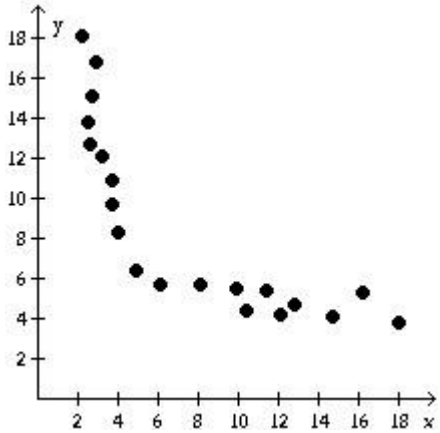


a. even

b. odd

c. neither

Q18. Determine if the type of relation is linear, nonlinear, or none.



a. None

b. Linear

c. Nonlinear

Q19. Find the value for the function.

Find f(x + h) when f(x) = $\frac{-3x + 5}{7x + 4}$.

- a. $\frac{-3x - 3h + 5}{7x + 7h + 4}$
- b. $\frac{-3x + 2h}{7x + 11h}$
- c. $\frac{-3x + 5h}{7x + 4h}$
- d. $\frac{-3x - 3h + 5}{7x + 4}$

Q20. The cost C of double-dipped chocolate pretzel O's varies directly with the number of pounds of pretzels purchased, P. If the cost is $5442 (typo, should be $54.42) when 5.0 pounds are purchased, find a linear function that relates the cost C to the number of pounds of pretzels purchased P. Then find the cost C when 6.0 pounds are purchased.

- a. C = 0.092P; $0.55
- b. C = 10.884P; $65.30
- c. C = $\frac{272.1}{P}$; $45.35
- d. C = 9.07P; $45.35

Q1. State whether the function is a polynomial function or not. If it is, give its degree. If it is not, tell why not.

f(x) = $\frac{8 - x^3}{8}$

- a. Yes; degree 3
- b. No; x is a negative term
- c. No; it is a ratio
- d. Yes; degree 1

Q2. Use the intermediate value theorem to determine whether the polynomial function has a zero in the given interval.

f(x) = $-2x^4 + 2x^2 + 4$; [-2, -1]

- a. f(-2) = 20 and f(-1) = 5; no
- b. f(-2) = -20 and f(-1) = 4; yes
- c. f(-2) = 20 and f(-1) = -4; yes
- d. f(-2) = -20 and f(-1) = -4; no

Q3. Find k such that f(x) = $x^4 + kx^3 + 2$ has the factor x + 1.

a. -3

b. -2

c. 3

d. 2

Q4. Solve the equation in the real number system.

$x^4 - 3x^3 + 5x^2 - x - 10 = 0$

a. {-1, -2}

b. {1, 2}

c. {-1, 2}

d. {-2, 1}

Q5. A developer wants to enclose a rectangular grassy lot that borders a city street for parking. If the developer has 320 feet of fencing and does not fence the side along the street, what is the largest area that can be enclosed?

a. 25,600 ft^2

b. 19,200 ft^2

c. 12,800 ft^2

d. 6400 ft^2

Q6. Determine, without graphing, whether the given quadratic function has a maximum value or a minimum value and then find that value.

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

a. minimum; - 1

b. maximum; 3

c. minimum; 3

d. maximum; - 1

Q7. Find the vertex and axis of symmetry of the graph of the function.

$f(x) = -3x^2 - 6x - 2$

a. (-1, 1) ; x = -1

b. (2, -26) ; x = 2

c. (1, -11) ; x = 1

d. (-2, -8) ; x = -2

Q8. Find the domain of the rational function.

g(x) = $\frac{x+5}{x^2+49x}$

a. all real numbers

b. $\{x|x \neq -7, x \neq 7, x \neq -5\}$

c. $\{x|x \neq -7, x \neq 7\}$

d. $\{x|x \neq 0, x \neq -49\}$

Q9. Determine whether the rational function has symmetry with respect to the origin, symmetry with respect to the y-axis, or neither.

f(x) = $\dfrac{-9x^2 - 9x - 10}{7x + 7}$

a. symmetry with respect to the origin

b. symmetry with respect to the y-axis

c. neither

Q10. Find all of the real zeros of the polynomial function, then use the real zeros to factor f over the real numbers.

$f(x) = 3x^4 - 6x^3 + 4x^2 - 2x + 1$

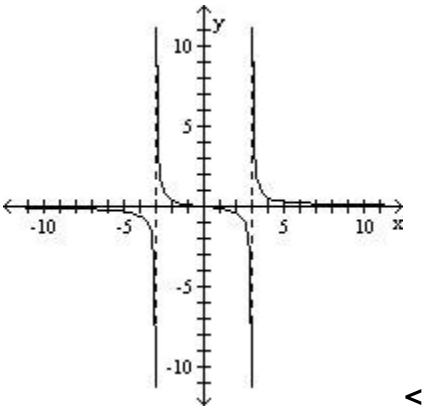
a. no real roots; $f(x) = (x^2 + 1)(3x^2 + 1)$

b. 1, multiplicity 2; $f(x) = (x - 1)^2(3x^2 + 1)$

c. -1, 1; $f(x) = (x - 1)(x + 1)(3x^2 + 1)$

d. -1, multiplicity 2; $f(x) = (x + 1)^2(3x^2 + 1)$

Q11. Use the graph to find the vertical asymptotes, if any, of the function.



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a. x = -3, x = 3, x = 0

b. x = -3, x = 3, y = 0

c. none

d. x = -3, x = 3

Q12. Find all zeros of the function and write the polynomial as a product of linear factors.

$f(x) = 3x^4 + 4x^3 + 13x^2 + 16x + 4$

a. $f(x) = (3x - 1)(x - 1)(x + 2)(x - 2)$

- [x] b. f(x) = (3x + 1)(x + 1)(x + 2i)(x - 2i)
- [ ] c. f(x) = (3x - 1)(x - 1)(x + 2i)(x - 2i)
- [ ] d. f(x) = (3x + 1)(x + 1)(x + 2)(x - 2)

Q13. Solve the inequality.

$(x - 5)(x^2 + x + 1) > 0$

- [ ] a. $(-\infty, -1)$ or $(1, \infty)$
- [ ] b. $(-1, 1)$
- [ ] c. $(-\infty, 5)$
- [x] d. $(5, \infty)$

Q14. Find the indicated intercept(s) of the graph of the function.

x-intercepts of f(x) = $\frac{2x + 7}{x - 5}$

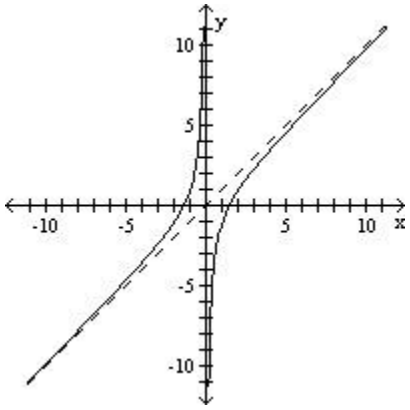
- [ ] a. (5, 0)
- [x] b. $\left(-\frac{7}{2}, 0\right)$
- [ ] c. $\left(\frac{7}{2}, 0\right)$
- [ ] d. (-5, 0)

Q15. Determine whether the rational function has symmetry with respect to the origin, symmetry with respect to the y-axis, or neither.

f(x) = $\frac{(5x - 15)(x - 6)}{x^2 + 18x - 19}$

- [ ] a. symmetry with respect to the y-axis
- [ ] b. symmetry with respect to the origin
- [x] c. neither

Q16. Use the graph to find the vertical asymptotes, if any, of the function.



- a. y = 0
- b. x = 0, y = 0
- c. x = 0
- d. none

Q17. Use the Theorem for bounds on zeros to find a bound on the real zeros of the polynomial function.

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

- a. -4 and 4
- b. -3 and 3
- c. -6 and 6
- d. -5 and 5

Q18. State whether the function is a polynomial function or not. If it is, give its degree. If it is not, tell why not.

$f(x) = 9x^3 + 8x^2 - 6$

- a. No; the last term has no variable
- b. Yes; degree 5
- c. Yes; degree 3
- d. Yes; degree 6

Q19. Find the domain of the rational function.

$f(x) = \frac{2x^2 - 4}{3x^2 + 6x - 45}$.

- a. $\{x|x \neq -3, x \neq 5\}$
- b. $\{x|x \neq 3, x \neq -5\}$
- c. all real numbers
- d. $\{x|x \neq 3, x \neq -3, x \neq -5\}$

Q20. Use the intermediate value theorem to determine whether the polynomial function has a zero in the given interval.

$f(x) = 8x^3 - 10x^2 + 3x + 5; [-1, 0]$

- a. f(-1) = -16 and f(0) = -5; no
- b. f(-1) = -16 and f(0) = 5; yes
- c. f(-1) = 16 and f(0) = -5; yes
- d. f(-1) = 16 and f(0) = 5; no

Q1. Change the exponential expression to an equivalent expression involving a logarithm.

$5^x = 125$

- a. $\log_{125} x = 5$
- b. $\log_5 125 = x$
- c. $\log_{125} 5 = x$
- d. $\log_x 125 = 5$

Q2. Find the effective rate of interest.

50.11% compounded daily

- a. 50.233%
- b. 51.015%
- c. 50.315%
- d. 64.997%

Q3. Express as a single logarithm.

$40 \log_5 \sqrt[5]{x} + \log_5(40x^6) - \log_5 40$

- a. $\log_5 x^{14/5}$
- b. $\log_5 x^{14}$
- c. $\log_5 x^{13/6}$
- d. $\log_5 x^{11/8}$

Q4. Change the exponential expression to an equivalent expression involving a logarithm.

$e^x = 25$

- a. $\log_{25} x = e$
- b. $\log_x e = 25$
- c. $\ln x = 25$
- d. $\ln 25 = x$

Q5. The half-life of silicon-32 is 710 years. If 100 grams is present now, how much will be present in 600 years? (Round your answer to three decimal places.)

- a. 0
- b. 0.286
- c. 94.311
- d. 55.668

Q6. The half-life of a radioactive element is 130 days, but your sample will not be useful to you after 80% of the radioactive nuclei originally present have disintegrated. About how many days can you use the sample?

- a. 302
- b. 287

c. 312

d. 297

Q7. Find functions f and g so that the composition of f and g is H.

$H(x) = |4 - 3x^2|$

a. $f(x) = x^2$; $g(x) = 4 - 3|x|$

b. $f(x) = 4 - 3|x|$; $g(x) = x^2$

c. $f(x) = |x|$; $g(x) = 4 - 3x^2$

d. $f(x) = 4 - 3x^2$; $g(x) = |x|$

Q8. The function f(x) = 1 + 1.6 ln (x+1) models the average number of free-throws a basketball player can make consecutively during practice as a function of time, where x is the number of consecutive days the basketball player has practiced for two hours. After how many days of practice can the basketball player make an average of 6 consecutive free throws?

a. 24 days

b. 80 days

c. 22 days

d. 78 days

Q9. Express as a single logarithm.

$3\log_6 x + 5\log_6(x - 6)$

a. $\log_6 x^3(x - 6)^5$

b. $\log_6 x(x - 6)^{15}$

c. $\log_6 x(x - 6)$

d. $15 \log_6 x(x - 6)$

Q10. If $7^{-x} = \frac{1}{4}$, what does 49^x equal?

a. 4

b. 16

c. -16

d. -4

Q11. Solve the equation.

$\log_3 x + \log_3(x - 24) = 4$

a. {-3, 27}

b. {27}

c. No real solutions

d. {53}

Q12. Change the logarithmic expression to an equivalent expression involving an exponent.

ln $\frac{1}{e^6}$ = -6

- a. $e^{-6} = \frac{1}{e^6}$
- b. $\left(\frac{1}{e^6}\right)^{-6} = e$
- c. $-6^e = \frac{1}{e^6}$
- d. $\left(\frac{1}{e^6}\right)^e = -6$

Q13. Find the amount that results from the investment.

$480 invested at 16% compounded quarterly after a period of 4 years

- a. $864.45
- b. $419.03
- c. $869.11
- d. $899.03

Q14. The function $A = A_o e^{-0.0099x}$ models the amount in pounds of a particular radioactive material stored in a concrete vault, where x is the number of years since the material was put into the vault. If 400 pounds of the material are initially put into the vault, how many pounds will be left after 40 years?

- a. 350 pounds
- b. 269 pounds
- c. 114 pounds
- d. 119 pounds

Q15. Find the amount that results from the investment.

$1,000 invested at 9% compounded annually after a period of 8 years

- a. $1828.04
- b. $1992.56
- c. $2171.89
- d. $992.56

Q16. The logistic growth function $f(t) = \frac{400}{1 + 9.0e^{-0.22t}}$ describes the population of a species of butterflies *tmonths* after they are introduced to a non-threatening habitat. How many butterflies are expected in the habitat after 12 months?

- a. 480 butterflies

- b. 401 butterflies
- c. 244 butterflies
- d. 4800 butterflies

Q17. If the following defines a one-to-one function, find the inverse.

{(6, 6), (12, 7), (10, 8), (8, 9)}

- a. {(7, 6), (9, 10), (6, 10), (7, 8)}
- b. {(7, 6), (6, 10), (6, 12), (7, 8)}
- c. Not a one-to-one function
- d. {(6, 6), (7, 12), (8, 10), (9, 8)}

Q18. Find the present value. Round to the nearest cent.

To get $10,000 after 2 years at 18% compounded monthly

- a. $5000.00
- b. $6995.44
- c. $8363.87
- d. $11,956.18

Q19. What principal invested at 8% compounded continuously for 4 years will yield $1190? Round the answer to two decimal places.

- a. $864.12
- b. $1188.62
- c. $1638.78
- d. $627.48

Q20. What annual rate of interest is required to triple an investment in 12 years?

- a. 4.794%
- b. 9.587%
- c. 9.155%
- d. 5.946%

Q1. A flat rectangular piece of aluminum has a perimeter of 62 inches. The length is 15 inches longer than the width. Find the width.

- a. 31 inches
- b. 38 inches
- c. 8 inches
- d. 23 inches

Q2. Write the partial fraction decomposition of the rational expression.

$$\frac{3x^3 + 2x^2}{(x^2+5)^2}$$

- a. $\frac{3x+2}{x^2+5} + \frac{15x+10}{(x^2+5)^2}$
- b. $\frac{3x+2}{x^2+5} + \frac{15x-10}{(x^2+5)^2}$
- c. $\frac{3x+2}{x^2+5} + \frac{-15x-10}{(x^2+5)^2}$
- d. $\frac{3x-2}{x^2+5} + \frac{-15x+10}{(x^2+5)^2}$

Q3. Find the inverse of the matrix.

A = $\begin{bmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 1 & 1 & 1 \end{bmatrix}$

- a. $\begin{bmatrix} -1 & 0 & 0 \\ -1 & -1 & 0 \\ -1 & -1 & -1 \end{bmatrix}$
- b. $\begin{bmatrix} 1 & -1 & 1 \\ 0 & 1 & -1 \\ 0 & 0 & 1 \end{bmatrix}$
- c. $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -2 & -1 & 1 \end{bmatrix}$
- d. $\begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \end{bmatrix}$

Q4. Solve the system.

$$\begin{cases} x + 2y = -9 \\ 5x + 10y = -45 \end{cases}$$

- a. inconsistent (no solution)
- b. (-9, 0)
- c. (0, 0)
- d. $y = -\frac{x}{2} - 9$, where x is any real number (typo, should be –x/2 – 9/2)

Q5. Jenny receives $1270 per year from three different investments totaling $20,000. One of the investments pays 6% , the second one pays 8%, and the third one pays 5%. If the money invested at 8% is $1500 less than the amount invested at 5%, how much money has Jenny invested in the investment that pays 6%?

- a. $8500
- b. $4500

c. $10,000

d. $1500

Q6. Use the properties of determinants to find the value of the second determinant, given the value of the first.

$$\begin{vmatrix} x & y & z \\ u & v & w \\ 1 & -1 & 3 \end{vmatrix} = -44 \qquad \begin{vmatrix} u & v & w \\ -2 & 2 & -6 \\ x & y & z \end{vmatrix} = ?$$

a. -44

b. 44

c. 88

d. -88

Q7. Perform the indicated operation, whenever possible.

$$\begin{bmatrix} -4 & -1 \\ 8 & -5 \\ -8 & -5 \end{bmatrix} + \begin{bmatrix} -8 & 7 \\ 6 & -6 \\ 1 & -1 \end{bmatrix}$$

a. $\begin{bmatrix} -12 & 6 \\ 14 & -11 \\ -7 & -6 \end{bmatrix}$

b. $\begin{bmatrix} -12 & -5 \\ 14 & -11 \\ -7 & -6 \end{bmatrix}$

c. $\begin{bmatrix} -12 & 6 \\ -14 & -5 \\ -7 & 6 \end{bmatrix}$

d. $\begin{bmatrix} 4 & -8 \\ 2 & 1 \\ -9 & 4 \end{bmatrix}$

Q8. Verify that the values of the variables listed are solutions of the system of equations.

$$\begin{cases} x + y = 0 \\ x - y = -10 \end{cases}$$

x = 5, y = 5

a. not a solution

b. solution

Q9. Find the inverse of the matrix.

$$\begin{bmatrix} 1 & 1 \\ 4 & 4 \end{bmatrix}$$

a. No inverse

b. $\begin{bmatrix} \frac{4}{15} & -\frac{1}{15} \\ -\frac{4}{15} & \frac{1}{15} \end{bmatrix}$

c. $\begin{bmatrix} -\frac{4}{15} & -\frac{1}{15} \\ -\frac{4}{15} & -\frac{1}{15} \end{bmatrix}$

d. $\begin{bmatrix} -\frac{4}{15} & \frac{1}{15} \\ \frac{4}{15} & -\frac{1}{15} \end{bmatrix}$

Q10. A tour group split into two groups when waiting in line for food at a fast food counter. The first group bought 8 slices of pizza and 4 soft drinks for $29.40. The second group bought 7 slices of pizza and 6 soft drinks for $30.30. How much does one slice of pizza cost?

a. $2.26 per slice of pizza

b. $2.76 per slice of pizza

c. $2.33 per slice of pizza

d. $1.83 per slice of pizza

Q11. Find the inverse of the matrix.

$\begin{bmatrix} 0 & 4 \\ -6 & 5 \end{bmatrix}$

a. $\begin{bmatrix} \frac{5}{24} & -\frac{1}{6} \\ \frac{1}{4} & 0 \end{bmatrix}$

b. $\begin{bmatrix} \frac{1}{4} & 0 \\ \frac{5}{24} & -\frac{1}{6} \end{bmatrix}$

c. $\begin{bmatrix} \frac{5}{24} & \frac{1}{6} \\ -\frac{1}{4} & 0 \end{bmatrix}$

d. $\begin{bmatrix} 0 & -\frac{1}{6} \\ \frac{1}{4} & \frac{5}{24} \end{bmatrix}$

Q12. Solve the system of equations.

$$\begin{cases} x - y + 2z = -1 \\ 2x + z = 0 \\ x + 5y + z = 5 \end{cases}$$

- (•) a. x = 0, y = 1, z = 0
- ( ) b. x = 1, y =1, z = 1
- ( ) c. x = 0, y = 1, z = -1
- ( ) d. x = 0, y = 0, z = 1

Q13. Use the elimination method to solve the system.

$$\begin{cases} 2x + 10y = -72 \\ 11x + 2y = 81 \end{cases}$$

- ( ) a. x = 11, y = -11
- ( ) b. x = -2, y = 9
- (•) c. x = 9, y = -9
- ( ) d. x = -9, y = 9

Q14. Write the partial fraction decomposition of the rational expression.

$$\frac{13x + 2}{(x - 1)(x^2 + x + 1)}$$

- (•) a. $\frac{5}{x - 1} + \frac{-5x + 3}{x^2 + x + 1}$
- ( ) b. $\frac{5}{x - 1} + \frac{3x - 5}{x^2 + x + 1}$
- ( ) c. $\frac{-5}{x - 1} + \frac{5x + 3}{x^2 + x + 1}$
- ( ) d. $\frac{5}{x - 1} + \frac{-5}{x + 1} + \frac{3}{x - 1}$

Q15. Solve the system using the inverse method.

$$\begin{cases} x + 2y + 3z = -2 \\ x + y + z = -7 \\ -x + y + 2z = -10 \end{cases}$$

- ( ) a. x = -19, y = -61, z = -35
- ( ) b. x = -1, y = -3, z = -2
- (•) c. x = 15, y = -49, z = 27
- ( ) d. x = -2, y = -28, z = 20

Q16. An 8-cylinder Crown Victoria gives 18 miles per gallon in city driving and 21 miles per gallon in highway driving. A 300-mile trip required 15.5 gallons of gasoline. How many whole miles were driven in the city?

- (•) a. 153 miles

b. 168 miles

c. 147 miles

d. 132 miles

Q17. The Family Fine Arts Center charges $21 per adult and $12 per senior citizen for its performances. On a recent weekend evening when 486 people paid admission, the total receipts were $6894. How many who paid were senior citizens?

a. 208 senior citizens

b. 368 senior citizens

c. 118 senior citizens

d. 278 senior citizens

Q18. Use the properties of determinants to find the value of the second determinant, given the value of the first.

Given $\begin{vmatrix} s & t & u \\ v & w & x \\ 4 & 2 & 8 \end{vmatrix}$ **> = 3, find the value of** $\begin{vmatrix} 32-s & 16-t & 64-u \\ v & w & x \\ 4 & 2 & 8 \end{vmatrix}$**>.**

a. -24

b. -3

c. 24

d. 3

Q19. Use Cramer's rule to solve the linear system.

$$\begin{cases} 2x + 3y = 14 \\ 2x - 3y = 2 \end{cases}$$

a. x = 2, y = 4

b. x = 4, y = 2

c. x = -2, y = 4

d. x = -4, y = -2

Q20. Rob bought 2 pairs of shorts, 3 shirts and a pair of shoes for $146.64. Jessie bought 3 pairs of shorts, 5 shirts and 2 pairs of shoes for $256.35. Allen bought a pair of shorts and 4 shirts for $104.07. What is the price of a pair of shorts? Express answer rounded to two decimal places.

a. $14.55

b. $50.40

c. $22.38

d. $10.30