**April 2015**

3) What is the value of the expression rad m/x-3 when x = -1 and m = -16?

A. -2

B. 2

C. 2 rad 2

D. 2*i*

E. 2*i* rad 2

35) For which of the equations below is its solution an integer?

1. 3n + 5 = 24
2. 5n + 3 = 23
3. 5(n + 3) = 25
4. I only
5. II only
6. III only
7. I and II only
8. II and III only

45) Given 3/x = 12 and x/y = 2, what is the value of y?

1. ⅛
2. ¼
3. ½
4. 8
5. 18

**June 2015**

3. If x2 + 4 = 29, then x2 - 4 = ?

1. 5
2. rad21
3. 21
4. 25
5. 33

18. The function *f* is defined as *f(x)* = -4x3 -4x2. What is the *f*(-4) ?

F. -320

G. -192

H. 16

J. 192

K. 320

38) At a local post office, on average, 3 customers are in line when the post office closed each day. The probability, P, that exactly *n* customers are in line when the post office closes can be modeled by the equation P = 3ne-3 / n! . Given that e-3 ≈ 0.05, which of the following values is closest to the probability that exactly 2 customers are in line when the post office closes?

**F.** 0.08

**G.** 0.11

**H.** 0.15

**J.** 0.23

**K.** 0.45

**December 2015**

3. The temperature F in degrees Fahrenheit is related is related to the temperature K in kelvins by the equation F = 1.8K - 459.67. Which of the following temperatures, in kelvins is closest to 120 degrees Fahrenheit?

1. 322
2. 461
3. 526
4. 580
5. 676

5. If rad(a) = b and b = 9, a = ?

1. 3
2. 18
3. 81
4. 9/2
5. 81/4

15. For the equation 3x + 15y = 9, which of the following expressions represents x in terms of y?

1. -15y + 3
2. -6y
3. -5y + 3
4. -5y + 9
5. -2y

21. The total cost, c dollars, for Main Street Orchestra to perform a concert at Milly’s Auditorium is determined by c = r + 20m, where r is the rental fee, in dollars, of the auditorium and m is the number of orchestra members playing. The Friday night rental fee for Milly’s Auditorium is $500. There will be 30 orchestra members playing in Friday night’s concert. For the total price of exactly 200 tickets to equal the total cost of performing the concert, what should be the price of each ticket?

1. $2.60
2. $2.65
3. $3.00
4. $4.50
5. $5.50

**June 2016**

1. If 4/y is 0.4, then y = ?

1. 0.04
2. 0.1
3. 0.4
4. 4
5. 10

17) A function *g* is defined as g(x,y,z) = 4xy - 3xz2. What is g(2,4,-3)?

**A.** -22

**B.** -4

**C.** 8

**D.** 68

**E.** 86

39) For what value of x is the equation cuberoot(3x - 9) + 10 = 13 true?

1. 4
2. 6
3. 12
4. 576
5. 4,058 ⅔

**April 2016**

9) If g(x) = 2x2 - 3x + 4, then g(-3) = ?

**A.** -23

**B**. -5

**C.** 1

**D.** 13

**E.** 31

13) The population of a particular town is modeled by the equation P = 120,000(1.1)t, where *t*  is the number of years after January 1, 2011. Based on the model, which of the following numbers is closest to the population of the town on January 1, 2013?

**A.** 132,000

**B.** 145,000

**C.** 160,000

**D.** 264,000

**E.** 396,000

40. Each student’s project in a history seminar is given a point score by the teacher and by each of the other students in the seminar. A student’s project grade, g, is determined by the formula g = (3t + s)/(3 + n), where t is the score the teacher gives, s is the sum of the scores the students give, and n is the number is students in the seminar. What is t in terms of g, s, and n?

1. t = g - n - s
2. t = gn + g - s
3. t = (3gn - s)/9
4. t = (gn - s)/3
5. t = (3g + gn - s)/3

**December 2016**

24. Given x = (4a + b)/3, which of the following expressions is equivalent to b?

1. 3x - 4a
2. 3x + 4a
3. x - (4a)/3
4. (x/3) - 4a
5. (x - 4a)/3

29. In Westville on Tuesday, the high temperature was 30°C and the low temperature was 20°C. What was the difference between the high and low temperatures, in degrees Fahrenheit?

(Note: The relationship between the temperature c, in degrees Celsius, and the temperature f, in degrees Fahrenheit, is given by c = 5/9 (f - 32).

1. 5 5/9°F
2. 10°F
3. 12 2/9°F
4. 18°F
5. 46°F

46. Given g(x) = (x + 1)/(x2), which of the following expressions is equal to g(x – 1) for all x in its domain?

F. (x)/(x2 – 2x + 1)

G. (x)/(x2 – 1)

H. (x)/(2x – 2)

J. (x + 1)/(x – 1)

K. (-x2 + x + 1)/(x2)

**June 2017**

21) Given functions f(x) = 2x + 1 and g(x) = x2 - 4, what is the value of f(g(-3)) ?

**A.** -29

**B. -**25

**C.** -19

**D.** 11

**E.** 21

**April 2017**

3. For what value of x is the equation 22x+7 = 215 true?

A. 2

B. 4

C. 11

D. 16

E. 44

4. Let the function *f* be defined as *f*(x) = 5x2 – 7(4x + 3). What is the value of *f*(3)?

F. -18

G. -26

H. -33

J. -60

K. -75

8. When x = ½, what is the value of (8x – 3) / x ?

F. 1/2

G. 2

H. 5/2

J. 5

K. 10

12. In Cherokee County, the fine for speeding is $17 for each mile per hour the driver is traveling over the posted speed limit. In Cherokee County, Kirk was fined $221 for speeding on a road with a posted speed limit of 30mph. Kirk was fined for traveling at what speed, in miles per hour?

1. 13
2. 17
3. 43
4. 47
5. 60

13. What is the sum of the solutions of the 2 equations below?

8x = 12

2y + 10 = 22

1. 2 (2/5)
2. 7 (1/2)
3. 9
4. 10
5. 17 (1/2)