Equation Set Up

June 2017

16. For the next school year, a college will use 1/9 of the money in its operating budget for library books and ⅙ of the money in its operating budget for scholarships. What fraction of the operating budget remains for the other uses?

1. 1/18
2. 5/18
3. 13/18
4. 20/27
5. 8/9

55. A sporting-goods store sells baseball caps for $22 each. At this price, 40 caps are sold per week. For every $1 decrease in price, the store will sell 4 more caps per week. The store will adjust the price to maximize revenue. What will be the maximum possible revenue for 1 week? (Note: The revenue equals the number of caps sold times the price per cap.)

1. $880
2. $882
3. $924
4. $960
5. $1,024

April 2017

18. For which of the following condition will the sum of integers *m* and *n always* be an odd integer?

F. *m* is an odd integer.

G. *n* is an odd integer.

H. *m* and *n* are both odd integers.

J. *m* and *n* are both even integers.

K. *m* is an odd integer and *n* is an even integer.

30. Maria ordered a pizza. She ate only 2/9 of it and gave the remaining pizza to her 3 brothers. What fraction of the whole pizza will each of Maria’s brothers receive, if they share the remaining pizza equally?

1. 7/9
2. 3/7
3. ⅓
4. 7/27
5. 2/27

36. The Smith family is planning to build a 3-room cabin which consists of 2 bedrooms (BR) and 1 living room (LR). Shown below are the rectangular floor plan (left figure) and a side view of the cabin (right figure). In the side view, the roof forms an isosceles triangle (triangleABC), the walls are perpendicular to the level floor (line)ED, (line)AC parallel (line)ED, F is the midpoint of (line)AC and (line)BF perpendicular (line)AC.

\*\*picture\*\*

During the week the Smiths plan to roof the cabin, there is a 20% chance of rain each day.

Mrs. Smith will install a ceiling fan in each room of the cabin and will place curtains over the 4 windows. Each of the ceiling fans has a price of $52.00. The price of curtains for each small window (S) is $39.50, and the price of curtains for the large window (L) is twice that for the small window. Based on this information, which of the following values is closest to the total price Mrs. Smith will pay for curtains and ceiling fans?

1. $262
2. $302
3. $341
4. $354
5. $393

42. The number of decibels, d, produced by an audio source can be modeled by the equation d = 10log(I/K), where I is the sound intensity of the audio source and K is a constant. How many decibels are produced by an audio source whose sound intensity is 1,000 times the value of K?

1. 4
2. 30
3. 40
4. 100
5. 10,000

April 2016

5. At a grocery store, Jo Ellen received $1.60 when she returned her cans, glass bottles, and plastic bottles. Jo Ellen received $0.05 for each can, $0.10 for each glass bottle, and $0.05 for each plastic bottle. She knew she had returned 6 cans and 8 glass bottles. How many plastic bottles did Jo Ellen return to the store?

1. 8
2. 9
3. 10
4. 12
5. 19

7) Sienna will be paid $75, plus 25% of her total weekly sales, for the hours she is scheduled to work next week. Let *w* represent Sienna’s total weekly sales, in dollars, for next week. Which of the following expressions gives Sienna’s pay, in dollars, for the hours she is scheduled to work next week?

**A.** 0.25w + 75

**B.** 0.25w + 0.75

**C.** 0.75w + 0.25

**D.** 25w + 75

**E.** 75w + 0.25

29. What positive number when divided by its reciprocal has a result of 4/25?

1. ⅖
2. 2/25
3. 5/2
4. 8/25
5. 25/8

56. If *a* is a positive even integer and *b* is a positive odd integer, then [(-3)(+3)]ab is:

F. positive and even.

G. positive and odd.

H. zero.

J. negative and even.

K. negative and odd.

June 2016

26) For his job delivering pizzas, Albert uses his own car and buys his own gas. He joined the local gas station’s Frequent Factor program that earns him points toward free gas each time he buys gas. Points are earned according to the following chart.

Frequent Fueler Program:

Sign up for the program, earn 50 points

Buy 1 gallon regular, earn 3 points

Buy 1 gallon premium, earn 4 points

At the end of his first month in the program, he received a statement showing that he had 545 points (including 50 points he received for signing up) and had purchased a total of 135 gallons of gas. To find how many gallons of premium he had purchased, he solved a system of equations with *r* representing the number of gallons of regular, and *p* representing the number of gallons of premium. One equation in his system was *r* + *p* = 135. Which of the following could have been his other equation?

**F.** 3*r* + 4*p* = 495

**G.** 3*r* + 4*p* = 595

**H.** 4*r* + 3*p* = 495

**J.** 4*r* + 3*p* = 545

**K.** 4*r* + 3*p* = 595

32) When a store sets the price of birdseed at $3.50 per pound, the store sells 2,500 pounds of birdseed per week. With each $0.25 increase in the $3.50 price per pound, the store sells 100 pounds less birdseed per week. Let *n* be the number of $0.25 increases in the price per pound. Which of the following expressions best represent the dollar amount of the store’s weekly sales of birdseed?

**F.** (3.75)(2,500 + 100*n*)

**G.** (3.75)(2,500 - 100*n*)

**H.** (2,500 + 0.25*n*) (100 + 3.50*n*)

**J.** (3.50 + 0.25*n*)(2,500 + 100*n*)

**K.** (3.50 + 0.25*n*)(2,500 - 100*n*)

40) Ten years ago, Tara invested $2,000 at 6% interest compounded monthly. Which of the following expressions represents today’s value of the investment?

F. $2,000e 0.6

G. $2,000(1 + 0.06) 10

H. $2,000(1 + 0.06/4) 40

J. $2,000(1 + 0.06/12) 120

K. $2,000 + $2,000(0.06)(10)

43) To plan orders for a party, a caterer uses the formula P = 64G/S, where P is the number of people, G is the number of gallons of punch, and S is the size of the cups in ounces. Which of the following gives the number of gallons of punch to order for a party of 200 people when 5-ounce cups will be used?

1. (5)(64)/200
2. (5)(200)/64
3. (64)(200)/5
4. 64/(5)(200)
5. 200/(5)(64)

December 2016

8. The cost of a long-distance call to a certain city is $1.05 for the first minute and $0.15 for each additional minute or part thereof. What is the cost of a 15-minute call to this city?

1. $1.20
2. $2.25
3. $3.15
4. $3.30
5. $3.45

11. Ben is saving money to buy a TV that costs $495, including tax. Ben opens a savings account with a deposit of $75 and deposits $65 at the end of each month. What is the minimum number of months Ben will need to make deposits until he has enough money in his account to buy the TV?

1. 5
2. 6
3. 7
4. 8
5. 9

37. Suzanne and Chad are going to bake and deliver cookies to college students during final exam week. They estimate it will cost $4 for the ingredients to make each batch of cookies and $50 to buy the mixer, bowls, and other utensils they will need. They decide to sell the cookies for $5 per batch. Assume they have no other expenses. Which of the following equations represent the profit, P dollars, they will make on b batches of cookies?

1. P = 49b
2. P = 54b - 5
3. P = 55b - 4
4. P = -b + 50
5. P = b -50

April 2015

39) On Monday, Jan and Diego opened separate bank accounts with initial deposits of $28.00 and $161.00, respectively. Every Monday after opening the accounts, Jan will add $18.25 to her account and Diego will withdraw $15.00 from his account. Which of the following equations, when solved, gives the number of weeks (*w*) after opening the accounts that Jan and Diego will have the same amount of money in their respective accounts?

(**Note:** They make no other deposits or withdrawals, and no interest is applied to the money in the accounts.)

**A.** -18.25*w* + 28 = -15*w* + 161

**B.** 18.25*w* + 28 = 15*w* + 161

**C.** 18.25*w* + 28 = 15*w* - 161

**D.** 18.25*w* + 28 = -15*w* + 161

**E.** 28*w* + 18.25 = 161*w* - 15

53) Suppose that equally spaced dots are marked on each side of a regular polygon, with a dot at each vertex, and that the distance between consecutive dots is the same for all sides. The figure below shows 4 equally spaced dots per side, including a dot at each vertex, for an equilateral triangle. Which of the following expressions represents the number of dots for a regular polygon with *n* equally spaced dots including one at each vertex, marked on each of its *s* sides?

(picture)

**A.** *ns*

**B.** *ns* - 1

**C.** *ns* - *s*

**D.** *ns* + *s*

**E.** *ns* - *n*

56) A storage facility is currently offering a special rate to customers who sign contracts for 6 months or more. According to this special rate, the first month’s rent is $1, and for each month after the first month, customers pay the regular monthly rental rate. The table below shows the storage unit sizes available, the floor dimensions, and the regular monthly rental rate. All the units have the same height.

|  |  |  |
| --- | --- | --- |
| Size | Floor Dimensions (in meters) | Regular Monthly Rental Rate |
| 1  2  3  4  5 | 2 \* 4  4 \* 4  4 \* 8  8 \* 8  8 \* 16 | $30  $60  $100  $150  $200 |

Janelle, the owner of the storage facility, is considering building new units that have floor dimensions larger than Size 5 units. She will use the floor area to determine the heating requirements of these larger units. For this calculation, Janelle will use the same relationship between the unit size number and the respective floor area for Sizes 1 through 5. Which of the following expressions gives the floor area, in square meters, of a Size *x* storage unit?

**F.**

**G.**

**H.**

**J.**

**K.**

June 2015

6) The square root of a certain number is approximately 9.2371. The certain number between what 2 integers?

**F.** 3 and 4

**G.** 4 and 5

**H.** 9 and 10

**J.** 18 and 19

**K.** 81 and 99

9) Andrea manages a company that currently has 116 customers, which is 8 more than twice the number of customers the company had 1 year ago. How many customers did the company have 1 year ago?

**A.** 50

**B.** 54

**C.** 62

**D.** 66

**E.** 100

26. For all nonzero values of a and b, the value of which of the following expressions is *always* negative?

F. a – b

G. -a – b

H. |a| + |b|

J. |a| - |b|

K. -|a| - |b|

28) 40% of 250 is equal to 60% of what number?

**F.** 150

**G.** 160

**H.** 166

**J.** 270

**K.** 375

32. For (triangle)ABC shown below, base (line)AC has a length of 16 inches and altitude (line)BD has a length of 8 inches. The area of a certain square is equal to the area of (triangle)ABC. What is the length, in inches, of a side of the square?

\*\*\*picture\*\*

1. 6
2. 8
3. 12
4. 16
5. 32

49) A circle, 2 chords, and some lengths, in centimeters, are shown in the figure below, which is not drawn to scale. What is the value of *x*?

(picture)

(**Note:** When two chords intersect, the product of the lengths of the segments of one chord equals the product of the lengths of the segments of the other chord.)

**A.** 10

**B.** 13.5

**C.** 14

**D.** 17.5

**E.** 19

50. If the area of KLMN in the figure below is 12 square centimeters, what is the length, in centimeters, of (line)LM?

\*\*picture\*\*

1. 2rad2
2. 5rad2
3. 6rad2
4. 2rad3
5. (12/5)rad3

December 2015

11) The speed of one motorcycle exceeds 4 times the speed of another motorcycle by 24 mph. The speed of the slower motorcycle is *g* mph. Which of the following expressions represents the speed of the faster motorcycle, in miles per hour?

**A.** *g* + 6

**B.** *g* + 24

**C.** *g* - 24

**D.** 4*g* + 24

**E.** 4*g* - 24

33. A function is defined by g(a) = -2a + 7, and its domain is the set of integers from 1 through 30, inclusive. For how many values of a is g(a) negative?

1. 26
2. 27
3. 28
4. 29
5. 30

48. For every negative real value of x, all of the following statements are true EXCEPT:

F. |x| > 0

G. 2x < 0

H. x5 < 0

J. x – x2 < 0

K. |x| - x = 0