Basic Algebra

1. If Lynn can type a page in p minutes, what piece of the page can she do in 5 minutes?

A. 5/p

B. p - 5

C. p + 5

D. p/5

E. 1- p + 5

2. If Sally can paint a house in 4 hours, and John can paint the same house in 6 hour, how long will it take for both of them to paint the house together?

A. 2 hours and 24 minutes

B. 3 hours and 12 minutes

C. 3 hours and 44 minutes

D. 4 hours and 10 minutes

E. 4 hours and 33 minutes

3. Employees of a discount appliance store receive an additional 20% off of the lowest price on an item. If an employee purchases a dishwasher during a 15% off sale, how much will he pay if the dishwasher originally cost $450?

A. $280.90

B. $287

C. $292.50

D. $306

E. $333.89

4. The sales price of a car is $12,590, which is 20% off the original price. What is the original price?

A. $14,310.40

B. $14,990.90

C. $15,290.70

D. $15,737.50

E. $16,935.80

5. Solve the following equation for A : 2A/3 = 8 + 4A

A. -2.4

B. 2.4

C. 1.3

D. -1.3

E. 0

6. If Leah is 6 years older than Sue, and John is 5 years older than Leah, and the total of their ages is 41. Then how old is Sue?

A. 8

B. 10

C. 14

D. 19

E. 21

7. Alfred wants to invest $4,000 at 6% simple interest rate for 5 years. How much interest will he receive?

A. $240

B. $480

C. $720

D. $960

E. $1,200

8. Jim is able to sell a hand-carved statue for $670 which was a 35% profit over his cost. How much did the statue originally cost him?

A. $496.30

B. $512.40

C. $555.40

D. $574.90

E. $588.20

9. The city council has decided to add a 0.3% tax on motel and hotel rooms. If a traveler spends the night in a motel room that costs $55 before taxes, how much will the city receive in taxes from him?

A. 10 cents

B. 11 cents

C. 15 cents

D. 17 cents

E. 21 cents

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10. A student receives his grade report from a local community college, but the GPA is smudged. He took the following classes: a 2 hour credit art, a 3 hour credit history, a 4 hour credit science course, a 3 hour credit mathematics course, and a 1 hour science lab. He received a "B" in the art class, an "A" in the history class, a "C" in the science class, a "B" in the mathematics class, and an "A" in the science lab. What was his GPA if the letter grades are based on a 4 point scale? (A=4, B=3, C=2, D=1, F=0)

A. 2.7

B. 2.8

C. 3.0

D. 3.1

E. 3.2

11. Simon arrived at work at 8:15 A.M. and left work at 10: 30 P.M. If Simon gets paid by the hour at a rate of $10 and time and ½ for any hours worked over 8 in a day. How much did Simon get paid?

A. $120.25

B. $160.75

C. $173.75

D. $180

E. $182.50

12. Grace has 16 jellybeans in her pocket. She has 8 red ones, 4 green ones, and 4 blue ones. What is the minimum number of jellybeans she must take out of her pocket to ensure that she has one of each color?

A. 4

B. 8

C. 12

D. 13

E. 16

13. If r = 5 z then 15 z = 3 y, then r =

A. y

B. 2 y

C. 5 y

D. 10 y

E. 15 y

14. If 300 jellybeans cost you x dollars. How many jellybeans can you purchase for 50 cents at the same rate?

A. 150/x

B. 150x

C. 6x

D. 1500/x

E. 600x

15. Lee worked 22 hours this week and made $132. If she works 15 hours next week at the same pay rate, how much will she make?

A. $57

B. $90

C. $104

D. $112

E. $122

16. If 8x + 5x + 2x + 4x = 114, the 5x + 3 =

A. 12

B. 25

C. 33

D. 47

E. 86

17. You need to purchase a textbook for nursing school. The book cost $80.00, and the sales tax where you are purchasing the book is 8.25%. You have $100. How much change will you receive back?

A. $5.20

B. $7.35

C. $13.40

D. $19.95

E. $21.25

18. You purchase a car making a down payment of $3,000 and 6 monthly payments of $225. How much have you paid so far for the car?

A. $3225

B. $4350

C. $5375

D. $6550

E. $6398

19. Your supervisor instructs you to purchase 240 pens and 6 staplers for the nurse's station. Pens are purchased in sets of 6 for $2.35 per pack. Staplers are sold in sets of 2 for 12.95. How much will purchasing these products cost?

A. $132.85

B. $145.75

C. $162.90

D. $225.25

E. $226.75

20. If y = 3, then y3(y3-y)=

A. 300

B. 459

C. 648

D. 999

E. 1099

Answers & Explanations

1. A: The following proportion may be written: 1/p=x/5. Solving for the variable, x, gives xp = 5, where x=5/p. So, Lynn can type 5/p pages, in 5 minutes.

2. A: Sally can paint 1/4 of the house in 1 hour. John can paint 1/6 of the same house in 1 hour. In order to determine how long it will take them to paint the house, when working together, the following equation may be written: 1/4 x+1/6 x=1. Solving for x gives 5/12 x=1, where x = 2.4 hours, or 2 hours, 24 minutes.

3. D: Sale Price = $450 - 0.15($450) = $382.50, Employee Price = $382.50 - 0.2($382.50) = $306

4. D: $12,590 = Original Price - 0.2(Original Price) = 0.8(Original Price), Original Price = $12,590/0.8 = $15,737.50

5. A: In order to solve for A, both sides of the equation may first be multiplied by 3. This is written as 3(2A/3)=3(8+4A) or 2A=24+12A. Subtraction of 12A from both sides of the equation gives -10A=24. Division by -10 gives A = -2.4.

6. A: Three equations may initially be written to represent the given information. Since the sum of the three ages is 41, we may write, l + s + j = 41, where l represents Leah's age, s represents Sue's age, and j represents John's age. We also know that Leah is 6 years older than Sue, so we may write the equation, l = s + 6. Since John is 5 years older than Leah, we may also write the equation, j = l + 5. The expression for l, or s + 6, may be substituted into the equation, j = l + 5, giving j = s + 6 + 5, or j = s + 11. Now, the expressions for l and j may be substituted into the equation, representing the sum of their ages. Doing so gives: s + 6 + s + s + 11 = 41, or 3s = 24, where s = 8. Thus, Sue is 8 years old.

7. E: Simple interest is represented by the formula, I = Prt, where P represents the principal amount, r represents the interest rate, and t represents the time. Substituting $4,000 for P, 0.06 for r, and 5 for t gives I = (4000)(0.06)(5), or I = 1,200. So, he will receive $1,200 in interest.

8. A: $670 = Cost + 0.35(Cost) = 1.35(Cost), Cost = $670/1.35 = $496.30

9. D: The amount of taxes is equal to $55*0.003, or $0.165. Rounding to the nearest cent gives 17 cents.

10. C: The GPA may be calculated by writing the expression, $((3*2)+(4*3)+(2*4)+(3*3)+(4*1))/13$, which equals 3, or 3.0.

11. C: From 8:15 A.M. to 4:15 P.M., he gets paid $10 per hour, with the total amount paid represented by the equation, $10*8=$80. From 4:15 P.M. to 10:30 P.M., he gets paid $15 per hour, with the total amount paid represented by the equation, $15*6.25=$93.75. The sum of $80 and $93.75 is $173.75, so he was paid $173.75 for 14.25 hours of work.

12. D: If she removes 13 jellybeans from her pocket, she will have 3 jellybeans left, with each color represented. If she removes only 12 jellybeans, green or blue may not be represented.

13. A: The value of z may be determined by dividing both sides of the equation, $r=5z$, by 5. Doing so gives $r/5=z$. Substituting $r/5$ for the variable, z, in the equation, $15z=3y$, gives $15(r/5)=3y$. Solving for y gives $r = y$.

14. A: 50 cents is half of one dollar, thus the ratio is written as half of 300, or 150, to x. The equation representing this situation is $300/x*1/2=150/x$.

15. B: The following proportion may be used to determine how much Lee will make next week: $22/132=15/x$. Solving for x gives $x = 90$. Thus, she will make $90 next week, if she works 15 hours.

16. C: The given equation should be solved for x. Doing so gives $x = 6$. Substituting the x-value of 6 into the expression, $5x + 3$, gives $5(6) + 3$, or 33.

17. C: The amount you will pay for the book may be represented by the expression, $80+(80*0.0825)$. Thus, you will pay $86.60 for the book. The change you will receive is equal to the difference of $100 and $86.60, or $13.40.

18. B: The amount you have paid for the car may be written as $3,000 + 6($225), which equals $4,350.

19. A: You will need 40 packs of pens and 3 sets of staplers. Thus, the total cost may be represented by the expression, 40(2.35) + 3(12.95). The total cost is $132.85.

20. C: Substituting 3 for y gives 33 (33-3), which equals 27(27 - 3), or 27(24). Thus, the expression equals 648.