**A4 Unit Exam – Use and Rearrange Formulas**

Topics Covered

* Using Formulas on the TASC Reference Sheet
* Using Formulas not on the TASC Reference Sheet
* Transforming Formulas

Standards

A.CED.4: Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm’s law V=IR to highlight resistance R.

* Low Emphasis
* Ex. Solve the equation  for .
* Ex. Rewrite the equation so that it demonstrates the hourly rate of pay.

A.SSE.1: Interpret expressions that represent a quantity in terms of its context.

* High Emphasis
* Ex. A mixture contains C liters of cleaning solution in 10 liters of water. Write an expression for the concentration of cleaning solution in the mixture, and explain what each part of the expression represents.

A.SSE.2: Use the structure of an expression to identify ways to rewrite it.

* Low Emphasis
* Ex. Identify two other ways to rewrite the equation .

A.SSE.3: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression

* Low Emphasis
* Ex. If the formula for the perimeter of a rectangle is , find the representation for.

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**Answer Key**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Correct** |  | **#** | **Correct** |  | **#** | **Correct** |  | **#** | **Correct** |  | **#** | **Correct** |  | **#** | **Correct** |
| 1 | C |  | 4 | C |  | 7 | B |  | 10 | A |  | 13 | B |  | 16 | B |
| 2 | D |  | 5 | C |  | 8 | A |  | 11 | C |  | 14 | D |  | 17 | D |
| 3 | A |  | 6 | C |  | 9 | B |  | 12 | D |  | 15 | A |  | 18 | C |

19. Rubric

 2-Points Examinee identifies 3 correct responses: C, D, AND E

 1-Point Examinee identifies 2 correct responses.

 0-Point Examinee identifies 1 or 0 correct response.

20. Rubric

 2-Points Examinee identifies the formula for the area of a circle , AND the formula for the circumference of a circle .

 1-Point Examinee identifies the formula for the area of a circle , OR the formula for the circumference of a circle .

 0-Point Examinee does not attempt to identify a formula or the formula is completely irrelevant or completely incorrect.

EXTRA CREDIT

21. C

22. B

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**A4 Unit Exam – Use and Rearrange Formulas**

1. Which formula can be used to find the volume of a cylinder?

 A. 

 B. 

 C. 

 D. 

2. A store display is in the shape of a pyramid with a square base. Which formula can be used to find the volume of the display?

 A. 

 B. 

 C. 

 D. 

3. Which of the following can be used to find solutions to the quadratic equation?

 A. 

 B. 

 C. 

 D. 

4. Which of the following can be used to find the slope of a line?

 A. 

 B. 

 C. 

 D. 

5. Albert Einstein’s theory of relativity is,where ** is energy, ** is mass, and ** is the speed of light. State the equation in terms of mass.

 A. 

 B. 

 C. 

 D. 

6. Michael borrows money from his uncle, who is charging him simple interest using the formula. To figure out what the interest rate, , is, Michael rearranges the formula to find . His new formula is

 A. 

 B. 

 C. 

 D. 

7. Ohm’s Law on electrical charge states that  where is the voltage,  is the current, and  is the resistance. State the equation in terms of resistance.

 A. 

 B. 

 C. 

 D. 

8. The equation for the volume of a cylinder is. The value of, in terms of  and**, is

 A. 

 B. 

 C. 

 D. 

9. The distance a free falling object has traveled can be modeled by the equation, where  is acceleration due to gravity and  is the amount of time the object has fallen. What isin terms of  and?

 A. 

 B. 

 C. 

 D. 

10. Given the equation of the line, find an equivalent equation for.

 A. 

 B. 

 C. 

 D. 

11. If the formula for the perimeter of a rectangle is ** , then *w* can be expressed as

 A. 

 B. 

 C. 

 D. 

12. The members of the senior class are planning a dance. They use the equation **to determine the total receipts. What is *n* expressed in terms of *r* and *p*?

A. 

 B. 

 C. 

 D. 

13. If, what is *y* in terms of *e*, *n*, *k*, and *t*?

 A. 

 B. 

 C. 

 D. 

14. If, then *t* equals

 A. 

 B. 

 C. 

 D. 

15. The speed of an induction motor (SRPM) given its supply frequency (FP) and the number of motor winding poles (P) is given below.

 

 Which equation should be used to find the number of motor winding poles (P) if the speed of an induction motor (SRPM) and supply frequency (FP) is given?

 A. 

 B. 

 C. 

 D. 

16. The formula  can be used to find the perimeter of a rectangle, *P* , given the length, , and width, , of the rectangle.

 Which interpretation of  is correct?

 A. The perimeter of a rectangle is twice the area of the rectangle.

 B. A rectangle has two sides of length  and two sides of length.

 C. Half of the perimeter of a rectangle is equal to the length of one side of the rectangle.

 D. To find the perimeter of a rectangle, add all the lengths of the sides of the rectangle and double it.

17. The Pythagorean Theorem  can be used to determine the length of the hypotenuse of a right triangle *c*, given its legs *a* and *b*.

 Which interpretation of  is correct?

 A. The hypotenuse, *c,* of a right triangle is equal to the product of its legs, *a* and *b*.

 B. The hypotenuse, *c,* of a right triangle is equal to the sum of its legs, *a* and *b*.

 C. The sum of the squares of the legs, *a* and *b,* of a right triangle is equal to the hypotenuse, *c,* of a right triangle.

 D. The sum of the squares of the legs, *a* and *b,* of a right triangle is equal to the square of the hypotenuse, *c,* of a right triangle.

18. The formula  can be used to find volume of a cube, *v*, given the length of a side, *s*.

 Which interpretation of  is correct?

 A. The volume of a cube is equal to three times its side, *s*.

 B. The volume of a cube is equal to the product of its side, *s* and 3.

 C. The volume of a cube is equal to the product of its length, *s*, width, *s*, and height, *s*.

 D. The volume of a cube is equal to the sum of its length, *s*, width, *s*, and height, *s*.

19. Which equations are correct representations of the Pythagorean Theorem?

 A. 

 B. 

 C. 

 D. 

 E. 

 F. 

20. What two formulas are needed to solve the geometry problem stated below?

 The circumference of a circular park is 34π yards.

 What is the area of the park?

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**Extra Credit**

21. A shopper is trying to compare prices of a certain medical product (P) in Duane Reade (DR) and Riteaid (RA). His equation is given below.

 

 Which equation should he use to solve for P, given the prices for DR and RA?

 A. 

 B. 

 C. 

 D. 

22. The number of costumes (N) sold just before halloween in Party City (PC) and costumeexpress.com (CEC) can be determined using the equation below.

 

 Which equation can be used to solve for N, if the number of costumes sold in PC and CEC are known?

 A. 

 B. 

 C. 

 D. 

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**Score Sheet and Report**

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| --- | --- | --- | --- |
| # | Answer | Subdomain Performance | Subdomain |
| 1 |  |  /4 % | Using Formulas on TASC Reference Sheet |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |  /11 % | Rearranging Formulas |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |
| 11 |  |
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| 13 |  |
| 14 |  |
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| 16 |  |  /3 % | Multiplication of Polynomials |
| 17 |  |
| 18 |  |
| 19 |  |  /2 | Multiple Selected Response |
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| 20 |  | Constructed Response – Record Your Answer Below |  |
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| 21 |  |  +  | Extra Credit |
| 22 |  |
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