

OLIVIA GRACE STUDY NOTES

ACCUPLACER

QUESTIONS & ANSWERS

BONUS STUDY GUIDE

Arithmetic

Level 1

1. Jenny consumes 102 mg of calcium daily. The recommended dietary allowance (RDA) of calcium for an adult is 1200 mg. Which of the following is closest to the percentage of RDA that Jenny consumes daily?
 - A. 0.08%
 - B. 8%
 - C. 10%
 - D. 84%
2. $1.91 + 9.19 = ?$
 - A. 10.11
 - B. 10.99
 - C. 11
 - D. 11.1

Level 2

3. Kate wanted to buy a red dress for the prom. Online, the dress cost \$176 whereas, at the store, the price was 25% higher. Kate decided to wait for the dress to go on sale at the store and buy it there. When the dress in the store was on sale, the price decreased by 20%. What was the store's sale price of the dress?
 - A. \$275
 - B. \$220
 - C. \$140.8
 - D. \$176

4. The perimeter of the blue rectangle is 24 inches; one side is equal to 8 inches. How many red squares are needed to fill the blue square if the area of the red square is 0.25 square inches?



- A. 6
- B. 32
- C. 64
- D. 128

Level 3

5. $0.56 \times 2.88 \div 0.12 + \frac{3}{4} = ?$

- A. 1.853
- B. 14.19
- C. 14.49
- D. 1386

6. If $P = \left(\frac{1}{4} + \frac{1}{5} + \frac{1}{20}\right) \times (0.38 + 0.9573)$, then P is between

- A. $0 < P < \frac{1}{10}$
- B. $\frac{1}{10} < P < \frac{1}{4}$
- C. $\frac{1}{2} < P < \frac{3}{4}$
- D. $2\frac{3}{4} < P < 3$

Elementary Algebra

Level 1

7. What is the value of the expression $(2x + 5y)(5x - 3y)$ when $x = 3$ and $y = -2$?

- A. -84
- B. -81
- C. 14
- D. 84

8. $\frac{\sqrt{5} \times \sqrt{10}}{\sqrt{2}}$

- A. $\sqrt{7.5}$
- B. $\sqrt{13}$
- C. $\sqrt{25}$
- D. $\sqrt{48}$

Level 2

9. Simplify the inequality: $-12.4x + 8x > -0.4x - 5.2 - 2.7x$

- A. $x > 4$
- B. $x < 4$
- C. $x < -4$
- D. $x > |-4|$

10. Each house in New Town costs five times the equivalent of a house in Old Town. Linda bought five houses in New Town and two houses in Old Town. Which of the following could she have bought for the same price?
- A. One house in New Town plus twenty five houses in Old Town
 - B. Seven houses in New Town
 - C. Three houses in New Town plus fourteen houses in Old Town
 - D. Two houses in New Town plus seventeen houses in Old Town

Level 3

11. Which of the following statements is not possible given the following rules?
- $$2a < |b|$$
- $$2b < |a|$$
- A. Both are negative.
 - B. They are equal.
 - C. Both are positive.
 - D. One is negative and the other is positive.
12. If $2y + 5x = 5$ and $4y - x = 21$, what is the value of $x + y$?
- A. -1
 - B. 2.5
 - C. 4
 - D. 6

College-Level Math

Level 1

13. For all x , $(\sin x + \cos x)^2 = ?$

- A. $\sin^2 x + \cos^2 x$
- B. $\tan^2 x$
- C. 1
- D. $1 + \sin 2x$
- E. $\sin^2 x - \cos^2 x$

14. What is the value of $f(g(-0.5))$

if $f(x) = x$ and $g(x) = (2x - 3)^2 - 4x(x - 0.5)$?

- A. 2
- B. 4
- C. 14
- D. 16
- E. 18

Level 2

15. What are the first term and the common difference in a mathematical sequence in which the sum of 10 terms is equal to 120, and the sum of 15 terms is equal to 255?

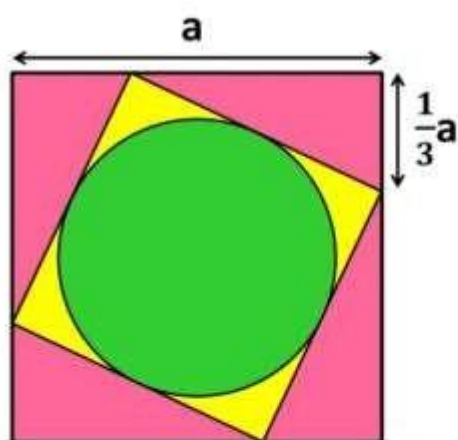
- A. $a_1 = 2; d = 3$
- B. $a_1 = 3; d = 2$
- C. $a_1 = 2; d = 6$
- D. $a_1 = 6; d = 2$
- E. Cannot be determined from the given information

16. $\frac{3^{b+2}(3^b - 2^b)}{9^b - 6^b}$; b is a natural number.

- A. $\frac{1}{9}$
- B. 9
- C. 3^{b+1}
- D. 9×1^b
- E. 3^{b^2+b}

Level 3

17. Calculate the yellow area in the drawing below:



- A. $\frac{5}{9}(1 - \pi)a^2$
- B. $(1 - \frac{5\pi}{36})a^2$
- C. $(\frac{20-5\pi}{36})a^2$
- D. $(\frac{100-25\pi}{324})a^4$
- E. $(\frac{5a-3\sqrt{5}\pi}{9})a$

18. Which one of the functions below is not an odd function ($f(-x) = -f(x)$)?

- A. $f(x) = 3x$
- B. $f(x) = x^3 + x$
- C. $f(x) = x^4 - x^2 + 2$
- D. $f(x) = \frac{x^2-1}{x}$
- E. $f(x) = \sqrt{x^2 + x} - \sqrt{x^2 - x}$

Sentence Skills

In questions 1-3 select the best replacement for the underlined part of the sentence. Answer (A) is the same as the original sentence. If you think the original sentence is best, choose answer (A).

1. Jalapeno which is a chili pepper that is mostly used to spice up various dishes.

A. which is a chili pepper
 B. is a chili pepper
 C. being a chili pepper
 D. is a chili pepper because

2. Reading the word “yawn” or “yawning” makes most people yawn.

A. Reading the word “yawn” or “yawning” makes
 B. Although they read the word “yawn” or “yawning”,
 C. They read the word “yawn” or “yawning” and,
 D. To read the word “yawn” or “yawning”,

3. A crab can live on land as long as they keep their gills moist.

A. A crab can live on land as long as they keep their
 B. Crabs can live on land as long as they keep their
 C. A crab can live on land as long as it keeps their
 D. Crabs can live on land as long as it keeps its

4. Jeremy was popular among students and teachers alike and was chosen as the valedictorian.

Rewrite, beginning with

Jeremy, popular among

The next words will be

A. students and teachers alike, being
 B. students and teachers alike who was
 C. students and teachers alike and have been
 D. students and teachers alike, was

5. The fire alarm went off, and everyone ran outside.

Rewrite, beginning with

Everyone ran outside

The next words will be

- A. when the fire alarm went off
- B. beginning to alarm
- C. and the fire alarm went off
- D. although the fire alarm went off

6. Annie felt wonderful when she rode a horse for the first time.

Rewrite, beginning with

Riding a horse for the first time,

The next words will be

- A. Annie is feeling wonderful
- B. a wonderful feeling was felt
- C. felt wonderful, Annie
- D. Annie felt wonderful

Reading Comprehension

7. *Goodnight Moon*, written by Margaret Wise Brown, is a classic American children's picture book. First published in 1947, it remains a highly popular bedtime story. The rhyming text describes a humanlike bunny's bedtime ritual of saying "goodnight" to the red balloon, the bunny's dollhouse, the light, and several objects in the bunny's bedroom.

According to this passage, Goodnight Moon is

- A. American literature
 - B. written in prose
 - C. old-fashioned
 - D. about a moon
8. The pencil is a modern-day version of a centuries-old writing implement. Around 1560, an Italian couple designed the modern, wood-encased pencil. Their creation was flatter and more compact than the pencils we use today. Their plan involved hollowing out a stick of wood and inserting a stick of graphite into it. Shortly after, a better technique was discovered: two wooden halves were carved, a graphite stick was inserted, and then the halves were glued together, which is also how pencils are currently made.

Although many people refer to the graphite inside pencils as "lead", they have always been made with graphite; however, the paint on the wood that surrounded the graphite was, at one time, lead-based.

According to the passage,

- A. lead has been used in pencils only in the last century
- B. today's pencil design is similar to that of the 16th century
- C. today pencils are made by scraping out sticks of wood
- D. graphite is not a major component of pencils

9. The pencil is a modern-day version of a centuries-old writing implement. Around 1560, an Italian couple designed the modern, wood-encased pencil. Their creation was flatter and more compact than the pencils we use today. Their plan involved hollowing out a stick of wood and inserting a stick of graphite into it. Shortly after, a better technique was discovered: two wooden halves were carved, a graphite stick was inserted, and then the halves were glued together, which is also how pencils are currently made.

Although many people refer to the graphite inside pencils as “lead”, they have always been made with graphite; however, the paint on the wood that surrounded the graphite was, at one time, lead-based.

According to the passage,

- A. pencils have never been made of wood
 - B. lead-based paint is dangerous
 - C. the original pencil design was the best one
 - D. pencils are writing devices
10. Happiness, which is also referred to as gladness or joy, is a mental or emotional state that is defined by positive or pleasant emotions ranging from contentment to intense joy.

According to a specialist, “happiness can refer to a way of thinking, such as being optimistic; a way of feeling joy, pleasure, relief, or gratitude; or simply a way of being.”

What does the second sentence do?

- A. It expands on the first.
- B. It states an effect.
- C. It contrasts with the first.
- D. It gives an example.

11. Cross-dominance, also known as mixed-handedness, is a motor skill expression in which a person favors one hand for some tasks and the other hand for others, being right-handed and left-handed at the same time, depending on the task.

Mixed-handed people seem to perform better than people with one dominant hand in sports such as basketball, ice hockey, and field hockey because these sports require active body movements and an ability to respond to movements from either side.

What does the second sentence do?

- A. It reinforces the information stated in the first.
- B. It states an effect caused by the information stated in the first.
- C. It draws a conclusion from the information stated in the first.
- D. It provides a contrast to the information stated in the first.

12. A Rolls-Royce car is almost entirely hand-crafted, and even to this day, every Rolls-Royce engine is built entirely by hand.

It takes about 13 hours to build a Toyota car; however, it takes approximately 5 months to build a Rolls-Royce car.

What does the first sentence do?

- A. It reveals a problem to which the second gives a solution.
- B. It states a fact while the second offers an opinion.
- C. It mentions a probable cause for the information stated in the second.
- D. It describes the consequence of the information mentioned in the second.

Answer Sheet

ACCUPLACER Math Questions

Arithmetic		Elementary Algebra		College-Level Math	
Question	Answer	Question	Answer	Question	Answer
1	B	7	A	13	D
2	D	8	C	14	C
3	D	9	B	15	B
4	D	10	D	16	B
5	B	11	C	17	C
6	C	12	C	18	C

ACCUPLACER English Questions

Sentence Skills		Reading Comprehension	
Question	Answer	Question	Answer
1	B	7	A
2	A	8	B
3	B	9	D
4	D	10	A
5	A	11	B
6	D	12	C

Explanations

Arithmetic

Level
1

1. Jenny consumes 102 mg of calcium daily. The recommended dietary allowance (RDA) of calcium for an adult is 1200 mg. Which of the following is closest to the percentage of RDA that Jenny consumes daily?

- A. 0.08%
- B. 8%
- C. 10%
- D. 84%

THE CORRECT ANSWER IS B.

Method A:

In order to solve this problem, set up an equation for the given data using the following percentage formula: $\% = (Fraction) \times 100$

The percentage Jenny consumes is:

$$\frac{102}{1200} \times 100 = \frac{102}{1200} \times \frac{100}{1} = \frac{102 \times \cancel{100}}{\cancel{1200} \times 1} = \frac{102 \times 1}{12 \times 1} = \frac{\cancel{102}}{\cancel{12}} = \frac{17}{2} = 8 \frac{1}{2} \longrightarrow 8.5\%$$

The calculated result is closest to 8%.

Method B:

$$1\% \text{ of } 1200 \text{ is } 12: \frac{1 \times \cancel{12} \cancel{00}}{1 \cancel{0} \cancel{0}} = 12$$

$$10\% \text{ of } 1200 \text{ is } 120: \frac{1 \cancel{0} \times \cancel{12} \cancel{0} \cancel{0}}{1 \cancel{0} \cancel{0}} = 120$$

102 is between 12 and 120, thus 102 is between 1% and 10%. The only possible answer is 8%.

The correct answer is **B**.

If you chose answers **A** or **D**, check the representation of the percentage as a fraction. If you chose answer **C**, review your calculations.

2. $1.91 + 9.19 = ?$

- A. 10.11
- B. 10.99
- C. 11
- D. 11.1

THE CORRECT ANSWER IS D.

Solve the equation using column addition:

$$\begin{array}{r} \\ 1.91 \\ + 9.19 \\ \hline 11.10 \end{array}$$

The result calculated is $1.91 + 9.19 = 11.10 = 11.1$; therefore, the correct answer is **D**.

If you chose any other answer, review your calculation, specifically in adding decimals.

Level 2

3. Kate wanted to buy a red dress for the prom. Online, the dress cost \$176 whereas, at the store, the price was 25% higher. Kate decided to wait for the dress to go on sale at the store and buy it there. When the dress in the store was on sale, the price decreased by 20%. What was the store's sale price of the dress?
- A. \$275
 - B. \$220
 - C. \$140.8
 - D. \$176

THE CORRECT ANSWER IS D.

Increasing a number by $X\%$ is equivalent to multiplying it by $1 + 0.X$, while decreasing a number by $X\%$ is equivalent to multiplying it by $1 - 0.X$.

The store's original price of the dress was 25% more than the online price, thus it was equivalent to multiplying the online price by 1.25. The store's sale price of the dress decreased by 20% and was equivalent to multiplying the store's original price by 0.8.

Now, set up the equation: *Price* \times *Increase* \times *Decrease* =?

$$176 \times 1.25 \times 0.8 = 176 \times \frac{\cancel{5}}{\cancel{4}} \times \frac{\cancel{4}}{\cancel{5}} = 176$$

According to the calculations, the store's sale price is equal to the online price of \$176; therefore, the correct answer is **D**.

If you chose answer **B**, you only calculated the store's original price; if you chose answer **C**, you calculated the store's sale price from the online price and not from the store's original price; if you chose answer **A**, you did not set up the equation properly. Review how to build and solve percentage problems.

4. The perimeter of the blue rectangle is 24 inches; one side is equal to 8 inches. How many red squares are needed to fill the blue square if the area of the red square is 0.25 square inches?



- A. 6
- B. 32
- C. 64
- D. 128

THE CORRECT ANSWER IS D.

Rectangles have both length and width, and the area is calculated by multiplying them: **Area = Length × Width** whereas a rectangle's perimeter is calculated by adding all the edges: **Perimeter = 2 × (Length + Width)**.

In order to solve this type of problem, summarize the information given in the question:

$$\text{Perimeter}_{\text{Blue}} = 24$$

$$\text{Side}_{\text{Blue}} = a = 8$$

$$\text{Area}_{\text{Red}} = 0.25$$

$$\text{Perimeter} = 2 \times a + 2 \times b$$

$$24 = 2 \times 8 + 2b$$

$$2b = 24 - 16 = 8$$

$$b = 8 \div 2 = 4$$

In order to find out how many red squares are needed to fill the blue rectangle, calculate the blue rectangle's area:

$$\text{Area} = a \times b$$

$$\text{Area}_{\text{Blue}} = 8 \times 4 = 32$$

In order to calculate how many red squares are needed to fill the blue rectangle divide their areas:

$$\text{Area}_{\text{Blue}} \div \text{Area}_{\text{Red}} = 32 \div 0.25 = ?$$

Convert the equation into fractions in order to simplify the calculation:

$$32 \div 0.25 = \frac{32}{1} \div \frac{25}{100} = \frac{32}{1} \div \frac{1}{4} = \frac{32}{1} \times \frac{4}{1} = \frac{32 \times 4}{1 \times 1} = \frac{128}{1} = 128$$

In order to fill the blue rectangle you need 128 red squares; therefore, the correct answer is **D**.

If you chose answer **A**, you multiplied the areas, instead of dividing them. If you chose answers **B** or **C**, review your calculation of the blue rectangle's sides and its area.

Level 3

5. $0.56 \times 2.88 \div 0.12 + \frac{3}{4} = ?$

- A. 1.853
- B. 14.19
- C. 14.49
- D. 1386

THE CORRECT ANSWER IS B.

First, decide whether to convert the decimal to a fraction or the fraction to a decimal. In this exercise it is easier to convert the fraction to a decimal: $\frac{3}{4} = 0.75$.

Rewrite the equation: $0.56 \times 2.88 \div 0.12 + 0.75 = ?$

Begin solving the equation by breaking down each part:

First, multiply: $0.56 \times 2.88 = ?$

In order to multiply the decimals, convert them to whole numbers by moving the decimal point: $0.56 \times 2.88 \longrightarrow 56 \times 288$

Now multiply:

$$\begin{array}{r}
 44 \\
 4+14 \\
 \times 288 \\
 \hline
 56 \\
 1728 \\
 + \\
 14400 \\
 \hline
 16128
 \end{array}$$

Do not forget to move the decimal point back: $16128. \longrightarrow 1.6128$

Next, continue with the division of the calculated result and the next decimal:

$$1.6128 \div 0.12 = ?$$

In order to divide the two decimals, move the decimal point in the divisor all the way to the right to make it a whole number. Move the decimal point the same number of places in the dividend.

$$1.6128 \div 0.12 \longrightarrow 16.128 \div 12$$

Now divide:

$$\begin{array}{r}
 013.44 \\
 12 \overline{)161.28} \\
 \underline{0} \\
 12 \\
 \underline{12} \\
 41 \\
 \underline{36} \\
 52 \\
 \underline{48} \\
 48 \\
 \underline{48} \\
 0
 \end{array}$$

Last, add the cumulative result calculated to the last decimal number of the equation: $13.44 + 0.75 = ?$

$$\begin{array}{r}
 1 \\
 + 13.44 \\
 \underline{0.75} \\
 14.19
 \end{array}$$

The final result is $0.56 \times 2.88 \div 0.12 + \frac{3}{4} = 14.19$; therefore, the correct answer is **B**.

If you chose answers **A** or **D** – review the order of operations in your calculation. **Remember that** multiplication and division operations are carried out before addition and subtraction operations. If you chose answer **C**, review your calculation.

6. If $P = \left(\frac{1}{4} + \frac{1}{5} + \frac{1}{20}\right) \times (0.38 + 0.9573)$, then P is between

- A. $0 < P < \frac{1}{10}$
- B. $\frac{1}{10} < P < \frac{1}{4}$
- C. $\frac{1}{2} < P < \frac{3}{4}$
- D. $2\frac{3}{4} < P < 3$

THE CORRECT ANSWER IS C.

According to the order of operations, first solve the additions in the parentheses, then multiply:

$$\left(\frac{1}{4} + \frac{1}{5} + \frac{1}{20}\right) = ?$$

$$(0.38 + 0.9573) = ?$$

The first parenthetical expression is solved by finding the lowest common denominator of the fractions. In this case, it is 20:

$$\left(\frac{1 \times 5}{4 \times 5} + \frac{1 \times 4}{5 \times 4} + \frac{1}{20}\right) = \left(\frac{5 + 4 + 1}{20}\right) = \frac{10}{20} = \frac{1}{2}$$

To solve the second parenthetical expression, use long addition:

$$\begin{array}{r} 1.1 \\ + 0.9573 \\ \hline 0.3800 \\ 1.3373 \end{array}$$

Now, rewrite the exercise: $\left(\frac{1}{2}\right) \times (1.3373) = ?$

In order to multiply the numbers, convert the fraction to a decimal:

$$\left(\frac{1}{2}\right) \times (1.3373) = \left(\frac{1 \times 5}{2 \times 5}\right) \times (1.3373) = \left(\frac{5}{10}\right) \times (1.3373) = 0.5 \times 1.3373 = ?$$

To simplify, move the decimal point:

$$0.5 \times 1.3373 = 5 \times 13373$$

Multiply:

$$\begin{array}{r} +1+1+3+1 \\ \times 13373 \\ \hline 5 \\ 66865 \end{array}$$

Check the answers:

A. $0 < P < \frac{1}{10} \longrightarrow 0 < P < 0.1$

B. $\frac{1}{10} < P < \frac{1}{4} \longrightarrow 0.1 < P < 0.25$

C. $\frac{1}{2} < P < \frac{3}{4} \longrightarrow 0.5 < P < 0.75$

D. $2\frac{3}{4} < P < 3 \longrightarrow 2.75 < P < 3$

Remember, you must return the decimal point the same number of spaces you moved it in order to discover the correct value: $6\ 6\ 8\ 6\ 5. \longrightarrow 0.66865$

$$P = \left(\frac{1}{4} + \frac{1}{5} + \frac{1}{20}\right) \times (0.38 + 0.9573) = 0.66865$$

To find the range in which P is located, convert the answers to decimals:

$$\frac{1}{10} = 0.1$$

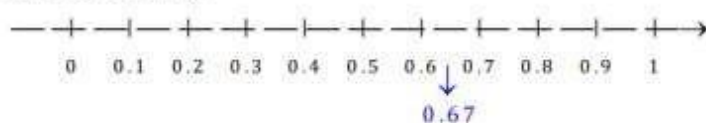
$$\frac{1}{2} = \frac{5}{10} = 0.5$$

$$\frac{1}{4} = \frac{25}{100} = 0.25$$

$$\frac{3}{4} = \frac{75}{100} = 0.75$$

$$2\frac{3}{4} = 2\frac{75}{100} = 2.75$$

P is located in the range of the third answer: $P = 0.66865 \cong 0.67$ is bigger than 0.5 and smaller than 0.75. You may place the result on a number line to see the answer clearly:



If you chose any other answer please review the solution.

Elementary Algebra

Level
1

7. What is the value of the expression $(2x + 5y)(5x - 3y)$ when $x = 3$ and $y = -2$?
- A. -84
 - B. -81
 - C. 14
 - D. 84

THE CORRECT ANSWER IS A.

Method A:

Substitute the values for x and y .

$$\begin{cases} (2x + 5y)(5x - 3y) = ? \\ x = 3 \\ y = -2 \end{cases}$$

↓

$$\begin{aligned} [2 \times 3 + 5 \times (-2)][5 \times 3 - 3 \times (-2)] &= [6 + (-10)][15 - (-6)] = \\ &= (6 - 10)(15 + 6) = (-4)(21) = -84 \end{aligned}$$

Method B:

Simplify the equation first, and then substitute the values for x and y :

$$(2x + 5y)(5x - 3y) = 2x \times 5x + 5x \times 3y - (2x \times 3y) =$$

$$= 10x^2 + 25xy - 6xy - 15y^2 = 10x^2 + 19xy - 15y^2$$

$$\begin{cases} 10x^2 + 19xy - 15y^2 \\ x = 3 \\ y = -2 \end{cases}$$

⇓

$$10(3)^2 + 19(3)(-2) - 15(-2)^2 = 10 \times 9 + 19 \times (-6) - 15 \times 4 =$$

$$= 90 - 114 - 60 = -84$$

Therefore, $(2x + 5y)(5x - 3y) = -84$ and the correct answer is **A**.

If you chose any other answer, review your calculations.

8. $\frac{\sqrt{5} \times \sqrt{10}}{\sqrt{2}}$
- A. $\sqrt{7.5}$
- B. $\sqrt{13}$
- C. $\sqrt{25}$
- D. $\sqrt{48}$

THE CORRECT ANSWER IS C.

To calculate this equation, use square roots rules:

$$\sqrt{ab} = \sqrt{a} \times \sqrt{b} \text{ and } \sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}} (b \neq 0)$$

Simplify the equation:

$$\frac{\sqrt{5} \times \sqrt{10}}{\sqrt{2}} = \frac{\sqrt{5 \times 10}}{\sqrt{2}} = \sqrt{\frac{5 \times \cancel{10}}{\cancel{2}}} = \sqrt{\frac{5 \times 5}{1}} = \sqrt{25}$$

According to the calculation, the correct answer is **C**.

If you chose any other answer, review the square roots rules.

Level 2

9. Simplify the inequality: $-12.4x + 8x > -0.4x - 5.2 - 2.7x$

- A. $x > 4$
- B. $x < 4$
- C. $x < -4$
- D. $x > |-4|$

THE CORRECT ANSWER IS B.

To solve this problem, apply the inequality rules of operations. Multiply both sides of the inequality in order to work with whole numbers:

$$\begin{aligned} -12.4x + 8x &> -0.4x - 5.2 - 2.7x && | \times 10 \\ -12.4x \times 10 + 8x \times 10 &> -0.4x \times 10 - 5.2 \times 10 - 2.7x \times 10 \\ -124x + 80x &> -4x - 52 - 27x \end{aligned}$$

Simplify the inequality by canceling down and moving like-terms:

$$\begin{aligned} -124x + 80x &> -4x - 52 - 27x \\ -44x &> -31x - 52 && | +31x \\ -44x + 31x &> -31x - 52 + 31x \\ -13x &> -52 && | +(-13) \\ x &< -52 \div (-13) \\ x &< 4 \end{aligned}$$

Remember, when you divide an inequality by a negative number, reverse the inequality sign.

According to the calculations, the correct answer is **B**.

If you chose answer **A**, you forgot to reverse the inequality sign when dividing by a negative number. If you chose answer **D**, review the definition of absolute value. If you chose answer **C**, review your calculations.

10. Each house in New Town costs five times the equivalent of a house in Old Town. Linda bought five houses in New Town and two houses in Old Town. Which of the following could she have bought for the same price?
- A. One house in New Town plus twenty five houses in Old Town
 - B. Seven houses in New Town
 - C. Three houses in New Town plus fourteen houses in Old Town
 - D. Two houses in New Town plus seventeen houses in Old Town

THE CORRECT ANSWER IS D.

To solve this problem, express the data given in an algebraic equation:

One house in New Town is equivalent in cost to 5 houses in Old Town.

Represent the cost of 1 house in Old Town by x ; accordingly, the cost of one house in New Town will be $5x$.

Linda spent the equivalent of 5 houses in New Town plus 2 houses in Old Town

$$\rightarrow 5 \times 5x + 2x = 25x + 2x = 27x$$

Check the answers to find which of the options costs $27x$:

A. One house in New Town plus twenty five houses in Old Town \rightarrow

$$1 \times 5x + 25x = 5x + 25x = 30x$$

B. Seven houses in New Town $\rightarrow 7 \times 5x = 35x$

C. Three houses in New Town plus fourteen houses in Old Town \rightarrow

$$3 \times 5x + 14x = 15x + 14x = 29x$$

D. Two houses in New Town plus seventeen houses in Old Town \rightarrow

$$2 \times 5x + 17x = 10x + 17x = 27x$$

Therefore, the only correct answer is D.

If you chose any other answer, review your calculations and the way you expressed the information given in the algebraic equations.

Level 3

11. Which of the following statements is not possible given the following rules?

$$2a < |b|$$

$$2b < |a|$$

- A. Both are negative.
- B. They are equal.
- C. Both are positive.
- D. One is negative and the other is positive.

THE CORRECT ANSWER IS C.

Remember that the absolute value is positive:

In order to solve this problem, check the options given in the answers:

Option A: Both numbers are negative

$$(a < 0) \text{ and } (b < 0)$$

Negative number Positive number

$$2a < |b|$$

Negative number Positive number

$$2b < |a|$$

This inequality is possible.

Option B: They are equal

$$a = b$$

Substitute into the two inequalities:

$$2a < |a|$$

$$2b < |b|$$

There are three possible cases for $a = b$: 1) $a = b = 0$, 2) $a = b$ and both are positive, 3) $a = b$ and both are negative.

Assess each of the options:

a) $a = b = 0$

$$a = b = 0$$

$$2a < |a|$$

$$2b < |b|$$

⇓

$$2 \times 0 < |0|$$

$$2 \times 0 < |0|$$

⇓

$$\begin{array}{l} \cancel{0 < |0|} \\ \cancel{0 < |0|} \end{array}$$

This is an incorrect inequality.

b) $a = b$ and both are positive

$(a = b)$ and $(a > 0)$ and $(b > 0)$

$$\begin{array}{cc} \text{Positive} & \text{Positive} \\ \text{number} & \text{number} \\ 2a & < |a| \end{array}$$

$$\begin{array}{cc} \text{Positive} & \text{Positive} \\ \text{number} & \text{number} \\ 2b & < |b| \end{array}$$

⇓

$$\begin{array}{l} \cancel{2a < a} \\ \cancel{2b < b} \end{array}$$

Consequently, this is also an incorrect inequality.

c) $a = b$ and both are negative

$(a = b)$ and $(a < 0)$ and $(b < 0)$

Negative number	Positive number
$2a$	$< a $
Negative number	Positive number
$2b$	$< b $

This inequality is possible; hence, this answer is possible when $a = b$ and both are negative.

Option C: Both numbers are positive

$(a > 0)$ and $(b > 0)$

Positive number	Positive number	Simplify	Positive number	Positive number	From the 2 Inequalities	Positive number	Positive number	Positive number	Positive number
$2a$	$< b $		$2a$	$< b$		$2a$	$< b$	$< 2b$	$< a$
Positive number	Positive number		Positive number	Positive number					
$2b$	$< a $		$2b$	$< a$					

This inequality is incorrect as it is impossible to get $2a < a$, when a is a positive number.

Option D: One number is positive and the other is negative

$(a > 0)$ and $(b < 0)$

Positive number	Positive number
$2a$	$< b $
Negative number	Positive number
$2b$	$< a $

This is possible if the absolute value of b is bigger than a .

$(a < 0)$ and $(b > 0)$

Negative number	Positive number
$2a$	$< b $
Positive number	Positive number
$2b$	$< a $

This is possible if the absolute value of a is bigger than b .

Therefore, option D is possible when the conditions are met.

Consequently, when both numbers are positive, the given inequalities are not possible; therefore, the correct answer is **C**.

If you chose any other answer, review the explanation and the rules of absolute value and inequality.

12. If $2y + 5x = 5$ and $4y - x = 21$, what is the value of $x + y$?

- A. -1
- B. 2.5
- C. 4
- D. 6

THE CORRECT ANSWER IS C.

To solve this problem, find the x and y values from the two system equations.

Method A:

Express x or y from one equation and substitute it in the other:

$$\begin{cases} 2y + 5x = 5 \\ 4y - x = 21 \end{cases}$$

$$2y + 5x = 5 \longrightarrow 5x = 5 - 2y \longrightarrow x = \frac{5 - 2y}{5}$$

$$4y - x = 21 \longrightarrow 4y - \frac{5 - 2y}{5} = 21$$

Substitute x in order to find y :

$$\begin{aligned} 4y - \frac{5 - 2y}{5} &= 21 \quad | \times 5 \\ 4y \times 5 - \frac{5 - 2y}{\cancel{5}} \times \cancel{5} &= 21 \times 5 \\ 20y - (5 - 2y) &= 105 \\ 20y - 5 + 2y &= 105 \\ 22y &= 110 \\ y &= 5 \end{aligned}$$

Substitute $y = 5$ into one of the given equations and find x :

$$2y + 5x = 5$$

$$y = 5$$

↓

$$2 \times 5 + 5x = 5$$

$$10 + 5x = 5$$

$$5x = 5 - 10 = -5$$

$$x = \frac{-5}{5} = -1$$

Method B:

Subtract one equation from the other in order to cancel x or y :

$$\begin{cases} 2y + 5x = 5 & \times 2 \\ 4y - x = 21 \end{cases}$$

↓

$$\begin{cases} 2y \times 2 + 5x \times 2 = 5 \times 2 \\ 4y - x = 21 \end{cases}$$

↓

$$-\begin{cases} 4y + 10x = 10 \\ 4y - x = 21 \end{cases}$$

↓

$$4y + 10x - (4y - x) = 10 - 21$$

↓

$$4y - 4y + 10x + x = -11$$

$$11x = -11$$

$$x = -1$$

Substitute $x = -1$ into one of the given equations, and find y :

$$y + 5x = 5$$

$$x = -1$$

↓

$$2y + 5(-1) = 5$$

$$2y - 5 = 5$$

$$2y = 5 + 5 = 10$$

$$y = \frac{10}{2} = 5$$

Calculate $x + y$: $x = -1$ and $y = 5$; therefore, $x + y = -1 + 5 = 4$.

The correct answer is **C**.

If you chose any other answer, review your calculations.

College-Level Math

Level
113. For all x , $(\sin x + \cos x)^2 = ?$

- A. $\sin^2 x + \cos^2 x$
- B. $\tan^2 x$
- C. 1
- D. $1 + \sin 2x$
- E. $\sin^2 x - \cos^2 x$

THE CORRECT ANSWER IS: D

$$(\sin x + \cos x)^2 = \sin^2 x + 2 \sin x \cos x + \cos^2 x$$

Remember basic trigonometric identities:

$$\sin^2 x + \cos^2 x = 1$$

$$2 \sin x \cos x = \sin(2x)$$

Now, rewrite the equation: $(\sin^2 x + \cos^2 x) + (2 \sin x \cos x) = 1 + \sin(2x)$ Accordingly, the explanation for the equation is: $(\sin x + \cos x)^2 = 1 + \sin(2x)$; therefore, the correct answer is **D**.

If you chose any other answer, review basic trigonometry identities.

14. What is the value of $f(g(-0.5))$ if $f(x) = x$ and $g(x) = (2x - 3)^2 - 4x(x - 0.5)$?

- A. 2
- B. 4
- C. 14
- D. 16
- E. 18

THE CORRECT ANSWER IS C.Place the value $x = -0.5$ in the given function $g(x)$:

$$g(-0.5) = \left(\begin{array}{c} \text{Number line from -1 to 1 with -0.5 marked} \\ 2(-0.5) - 3 \end{array} \right)^2 - 4 \left(\begin{array}{c} \text{Number line from -1 to 1 with -0.5 marked} \\ (-0.5)(-0.5 - 0.5) \end{array} \right) = (-4)^2 - 2 = 16 - 2 = 14$$

Next place the calculated value $g(-0.5) = 14$ in $f(x)$:

$$f(x) = x$$

$$f(g(-0.5)) = f(14) = 14$$

The final result is $f(g(-0.5)) = 14$; therefore, the correct answer is **C**.

If you chose answer B, you probably used 0.5 instead of (-0.5) . If you chose any other answer, review your calculations.

Level 2

15. What are the first term and the common difference in a mathematical sequence in which the sum of 10 terms is equal to 120, and the sum of 15 terms is equal to 255?

- A. $a_1 = 2; d = 3$
- B. $a_1 = 3; d = 2$
- C. $a_1 = 2; d = 6$
- D. $a_1 = 6; d = 2$
- E. Cannot be determined from the given information

THE CORRECT ANSWER IS B.

In order to solve this problem, use a formula suited to mathematical sequences:

$S_n = \frac{n}{2} \times [2a_1 + (n-1)d]$, in which d is the common difference, a_1 is the first term, n is the number of terms in the sequence, and S_n is the sum of the sequence.

Method A:

First, draw information from the question: $S_{10} = 120$ and $S_{15} = 255$.

Use the formula to express a_1 :

$$S_n = \frac{n}{2} \times [2a_1 + (n-1)d]$$

$$2S_n = n \times [2a_1 + (n-1)d]$$

$$\frac{2S_n}{n} = 2a_1 + (n-1)d$$

$$\frac{2S_n}{n} - (n-1)d = 2a_1$$

$$\cancel{\frac{2}{2}} \frac{S_n}{\cancel{n}} - \frac{(n-1)d}{2} = a_1$$

$$a_1 = \frac{S_n}{n} - \frac{(n-1)d}{2}$$

Then, use the given data to solve the equations:

$$\begin{cases} a_1 = \frac{S_{10}}{10} - \frac{(10-1)d}{2} = \frac{120}{10} - \frac{9}{2}d \\ a_1 = \frac{S_{15}}{15} - \frac{(15-1)d}{2} = \frac{255}{15} - \frac{14}{2}d \end{cases}$$

From these two equations, find d :

$$\begin{aligned} \frac{120}{10} - \frac{9}{2}d &= \frac{255}{15} - \frac{14}{2}d \\ -4.5d + 7d &= 17 - 12 \\ 2.5d &= 5 \\ d &= 2 \end{aligned}$$

Now place $d = 2$ in one of the equations and find a_1 :

$$d = 2$$

$$a_1 = \frac{120}{10} - \frac{9}{2}d = 12 - \frac{9}{2} \times 2 = 12 - 9 = 3$$

Method B:

Use the formula $S_n = \frac{n}{2} \times [2a_1 + (n-1)d]$, substitute the given data, and form two equations $S_{10} = 120$ and $S_{15} = 255$.

$$\begin{cases} 120 = \frac{10}{2} \times [2a_1 + (10-1)d] \\ 255 = \frac{15}{2} \times [2a_1 + (15-1)d] \end{cases}$$

↓

$$\begin{cases} 120 = 5 \times (2a_1 + 9d) \\ 255 = 7.5 \times (2a_1 + 14d) \end{cases}$$

↓

$$\begin{cases} 120 = 10a_1 + 45d \\ 255 = 15a_1 + 105d \end{cases}$$

↓ +5

$$\begin{cases} 24 = 2a_1 + 9d \\ 51 = 3a_1 + 21d \end{cases}$$

Multiply the first equation by 3 and the second by 2, and then subtract one from the other to cancel a_1 :

$$\begin{cases} 24 = 2a_1 + 9d & \times 3 \\ 51 = 3a_1 + 21d & \times 2 \end{cases}$$

↓

$$\begin{cases} 24 \times 3 = 2a_1 \times 3 + 9d \times 3 \\ 51 \times 2 = 3a_1 \times 2 + 21d \times 2 \end{cases}$$

↓

$$-\begin{cases} 72 = 6a_1 + 27d \\ 102 = 6a_1 + 42d \end{cases}$$

↓

$$72 - 102 = 6a_1 + 27d - 6a_1 - 42d$$

↓

$$-30 = \cancel{6a_1} + 27d - \cancel{6a_1} - 42d$$

↓

$$-30 = -15d$$

↓

$$\frac{-30}{-15} = d$$

↓

$$d = 2$$

Substitute $d = 2$ into one of the equations to find a_1 : $24 = 2a_1 + 9d$:

$$\begin{cases} 24 = 2a_1 + 9d \\ d = 2 \end{cases}$$

↓

$$24 = 2a_1 + 9 \times 2$$

$$24 = 2a_1 + 18$$

$$24 - 18 = 2a_1 + 18 - 18$$

$$6 = 2a_1$$

$$a_1 = 3$$

From the calculations $a_1 = 3$; $d = 2$; therefore, the correct answer is **B**.

If you chose answer **A**, you mixed a_1 and d . If you chose answers **C** or **D**, check your calculations. If you chose answer **E**, review the arithmetic sequence rules.

16. $\frac{3^{b+2}(3^b-2^b)}{9^b-6^b}$; b is a natural number.

- A. $\frac{1}{9}$
- B. 9
- C. 3^{b+1}
- D. 9×1^b
- E. 3^{b^2+b}

THE CORRECT ANSWER IS B.

In order to solve this exercise use the following exponents' rules: $a^n \times a^m = a^{n+m}$,

$$(a^n)^m = a^{n \times m}, \text{ and } \frac{a^n}{a^m} = a^{n-m}$$

Simplify the equation by using the rules above:

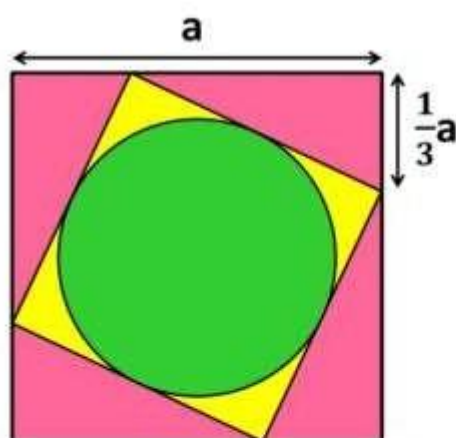
$$\frac{3^{b+2}(3^b-2^b)}{9^b-6^b} = \frac{3^b \times 3^2(3^b-2^b)}{(3^2)^b-6^b} = \frac{3^b \times 9(3^b-2^b)}{3^{2b}-6^b} = \frac{9(3^b \times 3^b - 2^b \times 3^b)}{3^{2b}-6^b} = \frac{9(\cancel{3^{2b}} - 6^b)}{\cancel{3^{2b}} - 6^b} = 9$$

From the calculations: $\frac{3^{b+2}(3^b-2^b)}{9^b-6^b} = 9$; therefore, the correct answer is **B**.

If you chose one of the other answers, review the exponents' rules.

Level 3

17. Calculate the yellow area in the drawing below:



- A. $\frac{5}{9}(1 - \pi)a^2$
- B. $(1 - \frac{5\pi}{36})a^2$
- C. $(\frac{20-5\pi}{36})a^2$
- D. $(\frac{100-25\pi}{324})a^4$
- E. $(\frac{5a-3\sqrt{5}\pi}{9})a$

THE CORRECT ANSWER IS C.

To solve this problem, calculate the yellow area by computing the whole square area and subtracting the area of the green circle:

Calculate the yellow square side using the Pythagorean Theorem ($a^2 + b^2 = c^2$):

$$(c_{\text{yellow}})^2 = \left(\frac{1}{3}a\right)^2 + \left(\frac{2}{3}a\right)^2$$

$$c_{\text{yellow}} = \sqrt{\left(\frac{1}{3}a\right)^2 + \left(\frac{2}{3}a\right)^2} = \sqrt{\left(\frac{1}{9}a^2\right) + \left(\frac{4}{9}a^2\right)} = \sqrt{\frac{5}{9}a^2} = \sqrt{\frac{5}{9}}\sqrt{a^2} = \frac{\sqrt{5}}{\sqrt{9}}a = \frac{\sqrt{5}}{3}a$$

The yellow square's edge is equal to the diameter of the circle:

$$c_{\text{yellow}} = d_{\text{green}} = \frac{\sqrt{5}}{3}a$$

The area of a circle: πr^2

The radius of a circle is equal to half of its diameter's length:

$$\begin{aligned}
 r_{\text{green}} &= d + 2 = \frac{\sqrt{5}}{3}a + 2 = \frac{\sqrt{5}}{3}a \times \frac{1}{2} = \frac{\sqrt{5}}{6}a \\
 s_{\text{green}} &= \pi \left(\frac{\sqrt{5}}{6}a \right)^2 = \pi \frac{5}{6^2}a^2 = \frac{5}{36}a^2\pi \\
 s_{\text{yellow} + \text{green}} &= \left(\frac{\sqrt{5}}{3}a \right)^2 = \frac{5}{3^2}a^2 = \frac{5}{9}a^2 \\
 s_{\text{yellow}} &= \frac{5}{9}a^2 - \frac{5}{36}\pi a^2 = a^2 \left(\frac{5}{9} - \frac{5\pi}{36} \right) = a^2 \left(\frac{5 \times 4}{9 \times 4} - \frac{5\pi}{36} \right) = a^2 \left(\frac{20 - 5\pi}{36} \right)
 \end{aligned}$$

Therefore, the correct answer is **C**.

If you chose answer **A**, you probably forgot to calculate the radius of the green circle and used the diameter instead. If you chose **B**, you probably subtracted the area of the green circle from the area of the pink square. If you chose answer **D**, you probably did not calculate the hypotenuse correctly. If you chose answer **E**, you probably used the wrong formula to calculate the green circle area.

18. Which one of the functions below is not an odd function ($f(-x) = -f(x)$)?

- A. $f(x) = 3x$
- B. $f(x) = x^3 + x$
- C. $f(x) = x^4 - x^2 + 2$
- D. $f(x) = \frac{x^2-1}{x}$
- E. $f(x) = \sqrt{x^2 + x} - \sqrt{x^2 - x}$

THE CORRECT ANSWER IS C.

In order to check which one of the functions is not an odd function, place $-x$ as an input, and simplify the output of the functions:

Function A:

$$f(x) = 3x$$

$$f(-x) = 3 \times (-x) = -3x = -f(x)$$

\Downarrow

$$f(-x) = -f(x)$$

Function B:

$$f(x) = x^3 + x$$

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

$$\Downarrow$$

$$f(-x) = -f(x)$$

Function C:

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

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

$$\Downarrow$$

$$f(-x) = f(x)$$

$$\Downarrow$$

$$f(-x) \neq -f(x)$$

Function D:

$$f(x) = \frac{x^2 - 1}{x}$$

$$f(-x) = \frac{(-x)^2 - 1}{(-x)} = \frac{x^2 - 1}{-x} = -1 \left(\frac{x^2 - 1}{x} \right) = - \left(\frac{x^2 - 1}{x} \right) = -f(x)$$

$$\Downarrow$$

$$f(-x) = -f(x)$$

Function E:

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

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

$$= -1 \left(-\sqrt{x^2 - x} + \sqrt{x^2 + x} \right) = - \left(\sqrt{x^2 + x} - \sqrt{x^2 - x} \right) = -f(x)$$

$$\Downarrow$$

$$f(-x) = -f(x)$$

The only function that is not an odd function is $f(x) = x^4 - x^2 + 2$; it is an even function $f(-x) = f(x)$. All other functions are odd functions $f(-x) = -f(x)$; therefore, the correct answer is **C**.
If you arrived at any other answer, review placement and function simplification.

Sentence Skills

In questions 1-3 select the best replacement for the underlined part of the sentence. Answer (A) is the same as the original sentence. If you think the original sentence is best, choose answer (A).

1. Jalapeno which is a chili pepper that is mostly used to spice up various dishes.
 - A. which is a chili pepper
 - B. is a chili pepper
 - C. being a chili pepper
 - D. is a chili pepper because

The correct answer is (B).

The original sentence creates a sentence-fragment error because it uses a relative clause which modifies the subject of the sentence, leaving the sentence lacking a conjugated verb.

Answer (C) creates a sentence fragment error because it lacks a conjugated verb. “Being” is not conjugated as it lacks tense.

Answer (D) is grammatically correct but changes the original meaning by incorrectly suggesting that the reason that a Jalapeno is a chili pepper is that it is mostly used to spice up various dishes.

Answer (B) is correct because it uses “is” as its conjugated verb.

The correct sentence is: **Jalapeno is a chili pepper that is mostly used to spice up various dishes.**

2. Reading the word “yawn” or “yawning” makes most people yawn.
 - A. Reading the word “yawn” or “yawning” makes
 - B. Although they read the word “yawn” or “yawning”,
 - C. They read the word “yawn” or “yawning” and,
 - D. To read the word “yawn” or “yawning”,

The correct answer is (A).

The original sentence is correct, consisting of a singular subject (“Reading”) and a singular verb (“makes”).

The word “makes” shows cause and effect: the reason that most people yawn is that they read the word “yawn” or “yawning”.

In answer (B) the word “although” implies that most people yawn despite reading the word “yawn” or “yawning”, when in fact, it is because of it.

In answer (C), the noun and pronoun are inverted, and the comma comes after the word “and”, rather than before it. Answer (D) attempts to create a modifying phrase, but incorrectly begins with an infinitive rather than a gerund (or a past participle).

The correct sentence is: **Reading the word “yawn” or “yawning” makes most people yawn.**

3. A crab can live on land as long as they keep their gills moist.
- A. A crab can live on land as long as they keep their
 - B. Crabs can live on land as long as they keep their
 - C. A crab can live on land as long as it keeps their
 - D. Crabs can live on land as long as it keeps its

The correct answer is (B).

In the original sentence, the plural pronoun “they” and “their” disagree with the singular noun “a crab”, resulting in a pronoun-noun agreement error.

Answers (C) and (D) repeat the same error.

Answer (B) is correct because the plural noun “crabs” agrees with the plural pronouns “they” and “their”.

The correct sentence is: **Crabs can live on land as long as they keep their gills moist.**

4. Jeremy was popular among students and teachers alike and was chosen as the valedictorian.

Rewrite, beginning with Jeremy, popular among

The next words will be

- A. students and teachers alike, being
- B. students and teachers alike who was
- C. students and teachers alike and have been
- D. students and teachers alike, was

The correct answer is (D).

Answer (A) lacks a conjugated verb, and incorrectly uses the unconjugated verb “being” instead.

Answer (B) uses the relative pronoun “who”, creating a relative clause instead of continuing the independent clause (“Jeremy was....”).

Answer (C) is incorrect because it creates a parallel construction error, connecting an adjective (“popular”) to a verb (“has”). In addition, the original sentence is written in the past tense whereas answer (C) is written in the present tense.

Answer (D) suggests that Jeremy was chosen as the valedictorian as a result of being popular among students and teachers. It also correctly uses the verb “was” which is singular and agrees with the subject “Jeremy”.

The correct sentence is: **Jeremy, popular among students and teachers alike, was chosen as the valedictorian.**

5. The fire alarm went off, and everyone ran outside.

Rewrite, beginning with

Everyone ran outside

The next words will be

- A. when the fire alarm went off
- B. beginning to alarm
- C. and the fire alarm went off
- D. although the fire alarm went off

The correct answer is (A).

Answer (B) continues the sentence with the verb “beginning”, indicating that everyone began to alarm when they ran outside, rather than they ran outside when the alarm went off.

Answer (C) uses the coordinating conjunction “and” improperly, as it requires a comma before it. In addition, it does not convey the same order of events as the original sentence, implying that first everyone ran outside and only then did the fire alarm go off.

In answer (D) the conjunction “although” illogically implies contradiction, while the original sentence conveys an order of events. Answer (A) is correct because it maintains the original chronological order.

The correct sentence is: **Everyone ran outside when the fire alarm went off.**

6. Annie felt wonderful when she rode a horse for the first time.

Rewrite, beginning with

Riding a horse for the first time,

The next words will be

- A. Annie is feeling wonderful
- B. a wonderful feeling was felt
- C. felt wonderful, Annie
- D. Annie felt wonderful

The correct answer is (D).

The rewrite begins with a modifying phrase. Therefore, it should be immediately followed by the noun it modifies, which is Annie. This eliminates answers (B) and (C), leaving us with answers (A) and (D).

Answer (A) correctly begins with “Annie”, but switches the tense from past simple in the original sentence to present progressive.

Answer (D) is correct because it correctly begins with “Annie” while maintaining the original past tense. The new sentence should read: Riding a horse for the first time, Anny felt amazing.

The correct sentence is: **Riding a horse for the first time, Annie felt wonderful.**

Reading Comprehension

7. *Goodnight Moon*, written by Margaret Wise Brown, is a classic American children's picture book. First published in 1947, it remains a highly popular bedtime story. The rhyming text describes a humanlike bunny's bedtime ritual of saying "goodnight" to the red balloon, the bunny's dollhouse, the light, and several objects in the bunny's bedroom.

According to this passage, Goodnight Moon is

- A. American literature
- B. written in prose
- C. old-fashioned
- D. about a moon

The correct answer is (A).

The passage clearly states that *Goodnight Moon* is a "classic American children's picture book", which means that it is American literature.

Answer (B) is incorrect because the passage states that the book is written in rhyme, not prose.

Answer (C) is incorrect because even though the book was published a long time ago, it is still popular today, which means that it is not old-fashioned.

Answer (D) is incorrect because the book is about the bunny's bedtime ritual of saying "goodnight" to several objects in the room and not about the moon.

8. The pencil is a modern-day version of a centuries-old writing implement. Around 1560, an Italian couple designed the modern, wood-encased pencil. Their creation was flatter and more compact than the pencils we use today. Their plan involved hollowing out a stick of wood and inserting a stick of graphite into it. Shortly after, a better technique was discovered: two wooden halves were carved, a graphite stick was inserted, and then the halves were glued together, which is also how pencils are currently made.

Although many people refer to the graphite inside pencils as "lead", they have always been made with graphite; however, the paint on the wood that surrounded the graphite was, at one time, lead-based.

According to the passage,

- A. lead has been used in pencils only in the last century
- B. today's pencil design is similar to that of the 16th century

- C. today pencils are made by scraping out sticks of wood
- D. graphite is not a major component of pencils

The correct answer is (B).

The paragraph mentions that the first pencil, which was created in the 16th century, was a hollow stick of wood with a stick of graphite inserted into it. Shortly after, a better technique was invented: two wooden halves were glued together after a graphite stick was inserted. This technique is used to this day.

Answer (A) is incorrect because lead is not used in pencils; there used to be a time that the paint on the outside of the pencil was leadbased; however, the passage does not mention when that was or if it was in the last century.

Answer (C) is incorrect because today pencils are made in the same way that they were made in the past, two wooden halves are glued together after a graphite stick is inserted in the middle.

Answer (D) is incorrect because graphite is the main component of the pencil, without which the pencil could not be used for writing and drawing; it is the component that allows the pencil to draw a mark.

9. The pencil is a modern-day version of a centuries-old writing implement. Around 1560, an Italian couple designed the modern, wood-encased pencil. Their creation was flatter and more compact than the pencils we use today. Their plan involved hollowing out a stick of wood and inserting a stick of graphite into it. Shortly after, a better technique was discovered: two wooden halves were carved, a graphite stick was inserted, and then the halves were glued together, which is also how pencils are currently made.

Although many people refer to the graphite inside pencils as “lead”, they have always been made with graphite; however, the paint on the wood that surrounded the graphite was, at one time, lead-based.

According to the passage,

- A. pencils have never been made of wood
- B. lead-based paint is dangerous
- C. the original pencil design was the best one
- D. pencils are writing devices

The correct answer is (D).

The first sentence mentions that the pencil is a writing tool.

Answer (A) is incorrect because the passage states that pencils have always been made of wood.

Answer (B) is incorrect because there is no mention in the passage of whether lead-based paint is dangerous or not.

Answer (C) is incorrect because the passage mentions that the original design of the pencil was “flatter and more compact than the pencils we use today”, but it does not necessarily mean that it was better or the best.

10. Happiness, which is also referred to as gladness or joy, is a mental or emotional state that is defined by positive or pleasant emotions ranging from contentment to intense joy.

According to a specialist, “happiness can refer to a way of thinking, such as being optimistic; a way of feeling joy, pleasure, relief, or gratitude; or simply a way of being.”

What does the second sentence do?

- A. It expands on the first.
- B. It states an effect.
- C. It contrasts with the first.
- D. It gives an example.

The correct answer is (A).

The first sentence discusses the definition of happiness. The second sentence elaborates on that with information about how happiness can be reflected.

Answer (B) incorrectly suggests that the information in the second sentence is caused by the information in the first.

Answer (C) is incorrect because there is no contrast between the information stated in the two sentences.

Answer (D) is incorrect because the second sentence does not give an example of happiness; it states the ways in which happiness is expressed.

11. Cross-dominance, also known as mixed-handedness, is a motor skill expression in which a person favors one hand for some tasks and the other hand for others, being right-handed and left-handed at the same time, depending on the task.

Mixed-handed people seem to perform better than people with one dominant hand in sports such as basketball, ice hockey, and field hockey because these sports require active body movements and an ability to respond to movements from either side.

What does the second sentence do?

- A. It reinforces the information stated in the first.

- B. It states an effect caused by the information stated in the first.
- C. It draws a conclusion from the information stated in the first.
- D. It provides a contrast to the information stated in the first.

The correct answer is (B).

The first sentence discusses what mix-handedness is. The second sentence states an advantage mix-handed people have in some sports because of their ability to use both hands.

Answer (A) incorrectly suggests that the second sentence supports the information in the first sentence, while it offers an outcome that is caused by that information.

Answer (C) is incorrect because the second sentence cannot be concluded directly from the first; studies on mix-handed people are what led to the conclusion stated in the second sentence.

Answer (D) is incorrect because there is no contrast between the information stated in the two sentences.

12. A Rolls-Royce car is almost entirely hand-crafted, and even to this day, every Rolls-Royce engine is built entirely by hand.

It takes about 13 hours to build a Toyota car; however, it takes approximately 5 months to build a Rolls-Royce car.

What does the first sentence do?

- A. It reveals a problem to which the second gives a solution.
- B. It states a fact while the second offers an opinion.
- C. It mentions a probable cause for the information stated in the second.
- D. It describes the consequence of the information mentioned in the second.

The correct answer is (C).

The first sentence states information about how RollsRoyce cars are manufactured. The second sentence states that building a Rolls-Royce car takes considerably more time than making other cars, such as Toyota. The fact that a Rolls-Royce car is mostly hand-built is probably why it takes so long to build it. The second sentence does not give a solution to the problem mentioned in the first, nor does it give an opinion; therefore, answers (A) and (B) are incorrect.

Answer (D) incorrectly suggests that the first sentence describes a consequence of the situation mentioned in the second sentence when in fact, it is the opposite – the second sentence describes the consequence of the information mentioned in the first.

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