

Consecutive Integer Problems

Consecutive Integers are in numerical order, like the pages of this worksheet packet. The four numbers $\{5, 6, 7, 8\}$ are consecutive integers. So are $\{-9, -8, -7, -6, -5\}$.

Consecutive EVEN integers are $\{\dots -8, -6, -4, -2, 0, 2, 4, 6, 8 \dots\}$ and skip by twos.

Consecutive ODD integers are $\{\dots -7, -5, -3, -1, 1, 3, 5, 7 \dots\}$ and also skip by twos.

Problem #1: Find three consecutive integers whose sum is 42.

Solution: Use variables to set up an equation for the problem.

Let x = the 1st integer

Let $x + 1$ = the 2nd integer

Let $x + 2$ = the 3rd integer

$$\begin{aligned}(x) + (x + 1) + (x + 2) &= 42 \\(x + x + x) + (1 + 2) &= 42 \\3x + 3 &= 42 \\3x &= 39 \\x &= 13\end{aligned}$$

Setup Equation.
Group the variables and constants.
Subtract 3 from both sides.
Divide both sides by 3.

Answer: The three integers are $\{13, 14, 15\}$

Problem #2: Find three consecutive even integers whose sum is -330 .

Solution: Consecutive even integers: $\{\dots -8, -6, -4, -2, 0, 2, 4 \dots\}$ skip by twos.

Let x = the 1st integer

Let $x + 2$ = the 2nd integer

Let $x + 4$ = the 3rd integer

$$\begin{aligned}(x) + (x + 2) + (x + 4) &= -330 \\(3x) + (6) &= -330 \\x &= -112\end{aligned}$$

Setup Equation
Group Terms
Subtract, Divide

Answer: The three integers are $\{-112, -110, -108\}$

Problem #3: The sum of 4 consecutive integers equals 5 times the least integer. Find the greatest integer.

Let x = the 1st integer

Let $x + 1$ = the 2nd integer

Let $x + 2$ = the 3rd integer

Let $x + 3$ = the 4th integer

Solution:

$$(x) + (x + 1) + (x + 2) + (x + 3) = 5x$$

$$4x + 6 = 5x$$

$$6 = x$$

The integers are {6,7,8,9}.

Answer: The greatest integer is 9.

Problem #4:

The product of two consecutive positive odd integers times 4 equals 252. Find both numbers.

Positive odd integers: {1,3,5,7,9,11,13,15...}

Let x = the 1st integer

Let $x + 2$ = the 2nd integer

Solution:

$$(x)(x + 2) * 4 = 252$$

$$(x)(x + 2) = 63$$

Since the two numbers are ODD, try a few from the set. By inspection,

$$7 * 9 = 63$$

Answer: The two consecutive odd integers are {7,9}.


SHSAT Lesson #13 Classwork: Consecutive Integer Problems

1. Find three consecutive integers whose sum is 36.	A. {35,36,37} B. {11,12,13} C. {14,15,16} D. {11,13,15} E. {10,12,14}
2. Find three consecutive integers whose sum is 99.	A. {30,31,32} B. {31,32,33} C. {32,33,34} D. {33,34,35} E. {34,35,36}
3. Three consecutive integers sum to -6 . What is the least number?	A. 2 B. 1 C. -1 D. -2 E. -3
4. Three consecutive integers sum to -120 . What is the second number?	A. -43 B. -42 C. -41 D. -40 E. -39
5. Five consecutive odd integers sum to 125. Find the middle number.	A. 19 B. 21 C. 23 D. 25 E. 27
6. Find three consecutive integers whose sum equals 102.	A. {34,35,36} B. {32,34,36} C. {30,32,34} D. {31,33,35} E. {33,34,35}

SHSAT Lesson #13: Classwork (EASY LEVEL)

7. Find three consecutive even integers whose sum is 126. Find the smallest number.	A. 36 B. 38 C. 40 D. 42 E. 44
8. Bill, training for a big race, ran 15 laps on Monday, then tapered by running 2 fewer laps each day for the next 5 days. Then he rested for a day before the big race. How many laps did he run in the six days he trained?	A. 72 B. 68 C. 64 D. 60 E. 54
9. Find five consecutive odd integers whose sum equals 5. Find the largest.	A. 9 B. 7 C. 5 D. 3 E. 1
10. There exist 2 consecutive integers whose sum plus 39 equals three times the smaller number. What is the larger number ?	A. 35 B. 38 C. 41 D. 44 E. 47
11. Six consecutive integers equal 27 when added together. Find the product of the largest two.	A. 42 B. 20 C. 12 D. 30 E. 56
12. Which of the following could be the sum of exactly three consecutive integers ?	A. 98 B. 198 C. 298 D. 398 E. 998

SHSAT Lesson #13: Classwork (MID LEVEL)

<p>13. Four consecutive even integers sum to 100. Find the 3rd largest.</p>	<p>A. 22 B. 24 C. 26 D. 28 E. 30</p>																														
<p>14. Thirteen less than the sum of five consecutive integers equals twice the smallest integer plus 57. Find the largest integer.</p>	<p>A. 24 B. 23 C. 22 D. 21 E. 20</p>																														
<p>15. A computer codes secret messages with the rule: <i>Code Letter = 27 - (place in English Alphabet).</i> (examples: A = 26. B = 25. C = 24. E = 22. J = 17. O = 12. T = 7 etc...) How does a person encode "HELLO" ?</p>	<p>A. 19 - 22 - 15 - 15 - 12 B. 15 - 22 - 19 - 19 - 22 C. 19 - 22 - 12 - 12 - 15 D. 18 - 21 - 16 - 16 - 1 E. 8 - 5 - 12 - 12 - 15</p>																														
<p>16. The early Americans of the 18th century used ciphers when writing letters. A common coding used by General Washington was the pigpen cipher:</p> <table border="1"> <tbody> <tr> <td style="text-align: center;"> <table border="1"> <tr><td>A</td><td>B</td><td>C</td></tr> <tr><td>D</td><td>E</td><td>F</td></tr> <tr><td>G</td><td>H</td><td>I</td></tr> </table> </td> <td style="text-align: center;"> <table border="1"> <tr><td>J</td><td>K</td><td>L</td></tr> <tr><td>M</td><td>N</td><td>O</td></tr> <tr><td>P</td><td>Q</td><td>R</td></tr> </table> </td> </tr> <tr> <td style="text-align: center;"> <table border="1"> <tr><td>S</td><td>U</td></tr> <tr><td>T</td><td>V</td></tr> </table> </td> <td style="text-align: center;"> <table border="1"> <tr><td>W</td><td>Y</td></tr> <tr><td>X</td><td>Z</td></tr> </table> </td> </tr> </tbody> </table> <p style="text-align: center;">Can you please translate the following word from PIGPEN code:</p> <p style="text-align: center;">  </p>	<table border="1"> <tr><td>A</td><td>B</td><td>C</td></tr> <tr><td>D</td><td>E</td><td>F</td></tr> <tr><td>G</td><td>H</td><td>I</td></tr> </table>	A	B	C	D	E	F	G	H	I	<table border="1"> <tr><td>J</td><td>K</td><td>L</td></tr> <tr><td>M</td><td>N</td><td>O</td></tr> <tr><td>P</td><td>Q</td><td>R</td></tr> </table>	J	K	L	M	N	O	P	Q	R	<table border="1"> <tr><td>S</td><td>U</td></tr> <tr><td>T</td><td>V</td></tr> </table>	S	U	T	V	<table border="1"> <tr><td>W</td><td>Y</td></tr> <tr><td>X</td><td>Z</td></tr> </table>	W	Y	X	Z	<p>A. TEAS B. MEAT C. FAIR D. WORK E. HELP</p>
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<p>17. Let n be an natural number from 10 to 35. For how many values of n will $\frac{n}{5}$ be a prime number ?</p>	<p>A. 3 B. 4 C. 6 D. 8 E. 26</p>																														
<p>18. Hal decided to make a clever "pin code" for his computer lock screen. The 8 digit code is composed from four consecutive even numbers in descending order. The sum of these four numbers, plus 18, equal 5 times the largest minus 30. What is his passcode pin number?</p>	<p>A. 36343230 B. 34323028 C. 32302826 D. 30282624 E. 28262422</p>																														

SHSAT Lesson #13: Classwork (CHALLENGE LEVEL)

<p>19. Four consecutive integers multiply to 5040. Find the sum of the four integers.</p>	<p>A. 26 B. 30 C. 34 D. 38 E. 42</p>																																			
<p>20. The counting numbers are placed in order in the chart, as shown. Assuming the pattern continues, in which column will the number 200 appear ?</p> <table border="1"> <thead> <tr> <th>p</th> <th>q</th> <th>r</th> <th>s</th> <th>t</th> <th>u</th> <th>v</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> <td>11</td> <td>12</td> </tr> <tr> <td>13</td> <td>14</td> <td>15</td> <td>16</td> <td>17</td> <td>18</td> <td>19</td> </tr> <tr> <td>20</td> <td>21</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> <td></td> </tr> </tbody> </table>	p	q	r	s	t	u	v			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		<p>A. q B. s C. t D. u E. v</p>
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<p>21. Five consecutive odd integers add up to the sum of -65. Find the 4th of the 5 integers when arranged from greatest to least.</p>	<p>A. -9 B. -11 C. -13 D. -15 E. -17</p>																																			
<p>22. Each of the integers from 11 to 19 inclusive is placed in a three by three “tic-tac-toe” board, with one number going into each box. If the sum of the numbers in each row is the same, what is that sum ?</p>	<p>A. 40 B. 42 C. 45 D. 46 E. 48</p>																																			
<p>23. Ten cards are numbered 10, 11, 12, . . . , 19, one number per card. Rosealee removes three cards whose numbers are primes, and puts the remaining cards in a hat. If one card is then drawn at random from the hat, what is the probability that it is a prime ?</p>	<p>A. $\frac{1}{10}$ B. $\frac{1}{9}$ C. $\frac{1}{5}$ D. $\frac{2}{5}$ E. None of these</p>																																			
<p>24. For <i>how many</i> integer values of n will the expression $\frac{n - 10}{14 - n}$ have a positive value ?</p>	<p>A. 0 B. 1 C. 3 D. 4 E. 5</p>																																			

SHSAT Lesson #13: Classwork: Grid In Questions (ALL LEVELS)

<p>25. (Easy Level)</p> <p>What is $(12a) - (4b) + (2ab) + 33$ when $a = -5$ and $b = -2$?</p>	Grid In
<p>26. (Easy Level)</p> <p>Convert $\frac{7}{16}$ into decimal rounded to the nearest thousandth.</p>	Grid In
<p>27. (Mid Level)</p> <p>Ronnie is half as old as Sammy, who is three times as old as Dean. The sum of their ages is 55. How old is Ronnie ?</p>	Grid In
<p>28. (Mid Level)</p> <p>What is the 7th term of the sequence $\{7, 9, 13, 21, \dots\}$?</p>	Grid In
<p>29. (Challenge Level)</p> <p>The prime factorization of 48 is $(2^a) * (3^b)$. What is $a + b$?</p>	Grid In
<p>30. (Challenge Level)</p> <p>Here are the test scores for five students: 79,79,81,82,84. How much greater is the mean than the mode ?</p>	Grid In


SHSAT Lesson #13 Homework: Consecutive Integer Problems

1. Find three consecutive integers whose sum is 24.	A. {7,8,9} B. {8,9,10} C. {9,10,11} D. {10,11,12} E. {11,12,13}
2. Find three consecutive integers whose sum is -66 .	A. $\{-23, -22, -21\}$ B. $\{-22, -21, -20\}$ C. $\{-21, -20, -19\}$ D. $\{-20, -19, -18\}$ E. $\{-19, -18, -17\}$
3. Bill, training for a big race, started his first week with 10 miles. Then he increases his total distance 3 miles each week for 6 weeks. How many miles total will he have trained after all 7 weeks?	A. 105 B. 126 C. 133 D. 164 E. 170
4. Four consecutive odd integers sum to 200. Find the largest number.	A. 45 B. 47 C. 49 D. 51 E. 53
5. Five consecutive odd integers sum to 75. Then what is the sum of the 1st & 5th?	A. 15 B. 25 C. 30 D. 45 E. 60
6. Emily said that the store price of the fruit will decrease in February. Each week, the fruit decreased in price \$0.25 per pound. If the original price was \$5.00 per pound during the 1st week, how much is 8 pounds of fruit in the final 5th week before it's too rotten to buy ?	A. \$28.00 B. \$29.00 C. \$30.00 D. \$31.00 E. \$32.00

SHSAT Lesson #13: Homework (EASY LEVEL)

7. What is the area of a circle whose radius equals 9 ?	A. 9π B. 18π C. 27π D. 81π E. 100π
8. There are 2 consecutive integers whose product is 132. What is 5 times the larger number ?	A. 55 B. 60 C. 65 D. 70 E. 75
9. Three consecutive even integers whose sum is 300. What is the least number?	A. 90 B. 92 C. 94 D. 96 E. 98
10. Three consecutive integers multiply to -24 . What is the least number?	A. -5 B. -4 C. -3 D. -2 E. -1
11. Six consecutive even integers add up to 30. What is the smallest number times the largest number ?	A. 0 B. 2 C. 4 D. 10 E. 20
12. The three sides of a right triangle are consecutive even integers. If the perimeter is 24, what is the longest side?	A. 10 B. 12 C. 14 D. 16 E. 18

SHSAT Lesson #13: Homework (MID LEVEL)

<p>13. Find five consecutive odd integers whose sum equals -5. Find the largest integer from the set.</p>	<p>A. -5 B. -3 C. -1 D. 1 E. 3</p>																														
<p>14. Four consecutive positive integers multiply to 5040. Find the sum of the first three.</p> <p>(Use the choices and work backwards)</p>	<p>A. 15 B. 18 C. 21 D. 24 E. 27</p>																														
<p>15. Eight consecutive even integers equal 56 when added together. Find the product of the first three.</p>	<p>A. 0 B. 2 C. 4 D. 24 E. 48</p>																														
<p>16. Five Consecutive integers add up to the sum of 440. Find twice the greatest of the 5 integers.</p>	<p>A. 182 B. 180 C. 178 D. 176 E. 174</p>																														
<p>17. A computer codes secret messages with the following rule: $Letter = 27 - (\text{place in English Alphabet})$. (examples: A = 26. B = 25. C = 24. E = 22. J = 17. O = 12. etc...) Decode the secret message "19, 22, 15, 15, 12 4, 12, 9, 15, 23"</p>	<p>A. JELLO MOLDS B. PENNY SMELT C. NARRY EARNS D. DITTO CODES E. HELLO WORLD</p>																														
<p>18. The early Americans of the 18th century used ciphers when writing letters. A common coding used by General Washington was the pigpen cipher:</p> <table border="1"> <tbody> <tr> <td style="text-align: center;"> <table border="1"> <tr><td>A</td><td>B</td><td>C</td></tr> <tr><td>D</td><td>E</td><td>F</td></tr> <tr><td>G</td><td>H</td><td>I</td></tr> </table> </td> <td style="text-align: center;"> <table border="1"> <tr><td>J</td><td>K</td><td>L</td></tr> <tr><td>M</td><td>N</td><td>O</td></tr> <tr><td>P</td><td>Q</td><td>R</td></tr> </table> </td> </tr> <tr> <td style="text-align: center;"> <table border="1"> <tr><td>S</td><td>U</td></tr> <tr><td>T</td><td>V</td></tr> </table> </td> <td style="text-align: center;"> <table border="1"> <tr><td>W</td><td>Y</td></tr> <tr><td>X</td><td>Z</td></tr> </table> </td> </tr> </tbody> </table> <p style="text-align: center;">Can you please translate the following word from PIGPEN code:</p> <p style="text-align: center;">  </p>	<table border="1"> <tr><td>A</td><td>B</td><td>C</td></tr> <tr><td>D</td><td>E</td><td>F</td></tr> <tr><td>G</td><td>H</td><td>I</td></tr> </table>	A	B	C	D	E	F	G	H	I	<table border="1"> <tr><td>J</td><td>K</td><td>L</td></tr> <tr><td>M</td><td>N</td><td>O</td></tr> <tr><td>P</td><td>Q</td><td>R</td></tr> </table>	J	K	L	M	N	O	P	Q	R	<table border="1"> <tr><td>S</td><td>U</td></tr> <tr><td>T</td><td>V</td></tr> </table>	S	U	T	V	<table border="1"> <tr><td>W</td><td>Y</td></tr> <tr><td>X</td><td>Z</td></tr> </table>	W	Y	X	Z	<p>A. SOLDIER B. VICTORY C. GLASSES D. TRACKER E. WEATHER</p>
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SHSAT Lesson #13: Homework (CHALLENGE LEVEL)

<p>19. The following sequence of eight numbers, each number has one more “1” than the number before it:</p> <p style="text-align: center;">$2, 12, 112, 1112, \dots, 11111112$</p> <p>What is the hundreds digit in the sum of all eight of these numbers ?</p>	<p>A. 0 B. 6 C. 7 D. 8 E. 9</p>									
<p>20. In this “semi-magic” figure, integers are to be placed in each of nine small squares such that the sum of the numbers in any row, column must be the same. The number x</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td style="width: 30px; height: 30px;"></td> <td style="width: 30px; height: 30px; text-align: center;">13</td> <td style="width: 30px; height: 30px;"></td> </tr> <tr> <td style="width: 30px; height: 30px; text-align: center;">15</td> <td style="width: 30px; height: 30px;"></td> <td style="width: 30px; height: 30px; text-align: center;">X</td> </tr> <tr> <td style="width: 30px; height: 30px; text-align: center;">10</td> <td style="width: 30px; height: 30px; text-align: center;">9</td> <td style="width: 30px; height: 30px; text-align: center;">4</td> </tr> </tbody> </table>		13		15		X	10	9	4	<p>A. will be 1. B. will be 3. C. will be 5. D. will be 7. E. No solution.</p>
	13									
15		X								
10	9	4								
<p>21. Here are two sequences:</p> <p style="text-align: center;">Sequence F: $2, 7, 12, \mathbf{17}, 22, \dots$ Sequence S: $3, 10, \mathbf{17}, 24, 31, \dots$</p> <p style="text-align: center;">The numbers in sequence F increase by fives. The numbers in sequence S increase by sevens. The first number that occurs in both sequences is 17. What is the next number that occurs in both sequences ?</p>	<p>A. 87 B. 85 C. 72 D. 65 E. 52</p>									
<p>22. In writing the integers from 1 up to and including 50, how many times is the digit “2” written ?</p>	<p>A. 5 B. 13 C. 14 D. 15 E. 16</p>									
<p>23. Which of the following is the only number that could be the sum of 5 consecutive integers ?</p> <p style="text-align: center;">(Think of the one’s digits that are possible.)</p>	<p>A. 43,210 B. 43,211 C. 43,212 D. 43,213 E. 43,214</p>									
<p>24. The sum of three friends ages is 126 years. If all their ages are multiples of six, find the age of the youngest</p>	<p>A. 54 B. 36 C. 30 D. 24 E. Cannot be determined</p>									

SHSAT Lesson #13: Homework: Grid In Questions (ALL LEVELS)

<p>25. (Easy Level)</p> <p>What is the value of $(x - y)(x + y)$ when $x = 2.5$ and $y = 3.5$?</p>	Grid In
<p>26. (Easy Level)</p> <p>One night, Angel spent 2 hours and 40 minutes doing homework. She spent 43 minutes on math, 36 minutes on language arts, and half an hour on science. The rest of her time was spent on social studies. How much time, in minutes, did she spend on social studies ?</p>	Grid In
<p>27. (Mid Level)</p> <p>The Landmark Theater contains 3 sections of 19 rows on the main level. Each row contains 12 seats. The balcony has 2 sections of 8 rows, with 8 seats in each row. How many people can sit in the theater seat ?</p>	Grid In
<p>28. (Mid Level)</p> <p>The White-Bright Toothbrush Company hired 30 new employees. This hiring increased the company's total workforce by 5%. How many employees now work at White-Bright ?</p>	Grid In
<p>29. (Challenge Level)</p> <p>If the expression $4 + 2(3y - 2) = - 10$, then $(3y - 2)$ equals</p>	Grid In
<p>30. (Challenge Level)</p> <p>The formula for the volume of a sphere is $V = \frac{4}{3}\pi(r^3)$, where $V = \text{volume}$ and $r = \text{radius}$. If the diameter of the sphere is 7 cm, then the volume is $\frac{a}{3} (\pi) \text{ cubic centimeters}$.</p> <p>What is "a" ? (Use: $\pi = \frac{22}{7}$.)</p>	Grid In

JW2542 for Chang Learning 2023 (Set F)