

MATHEMATICS FOCUSED QUIZ 1: MULTIPLICATION PRINCIPLE

1. A runner has five flavors of cereal bars and four flavors of energy gels. In how many distinct ways can she consume all of them, in order?
 - a. 362,880
 - b. 181,440
 - c. 90,770
 - d. 72,140
 - e. 84,180

2. How many unique three-digit numbers can be made from the numerals 1 to 6, if repetition is allowed?
 - a. 84
 - b. 62
 - c. 102
 - d. 216
 - e. 42

3. In how many sequences can an album with 10 songs be played, assuming the first and last song are fixed?
 - a. 161,280
 - b. 40,320
 - c. 80,640
 - d. 20,160
 - e. 10,080

4. A gamer is building a new computer. She can choose from 3 types of keyboards, 4 brands of GPUs, and 4 makes of CPU. How many possible computers can she make?
 - a. 84
 - b. 72
 - c. 56
 - d. 48
 - e. 24

5. Lan is building a burger with a choice of 5 patties, 4 dressings, 2 buns, and 3 cheeses. Assuming dressing and cheese are optional, how many different burgers can she build?
 - a. 60
 - b. 150
 - c. 400
 - d. 50
 - e. 200

6. Crystal has 7 books. She wants to read 2 books first in either order, and the remaining 5 books in any order. In how many different sequences can she read the books?
- a. 1680
 - b. 70
 - c. 240
 - d. 80
 - e. 160
7. A 4-digit code cannot have repetition in numerals. How many codes are possible?
- a. 5,040
 - b. 2,520
 - c. 1,270
 - d. 635
 - e. 1,905
8. A musical trio of 3 different instruments must be formed from 6 flutists, 5 violinists, and 4 pianists. How many possible trios are there?
- a. 720
 - b. 120
 - c. 1,040
 - d. 60
 - e. 2,080
9. A 3-course meal can be composed from 5 different appetizers, 3 main courses, and 7 desserts. If a diner is allergic to an ingredient in one of the appetizers and main courses, how many different meals can they create?
- a. 420
 - b. 210
 - c. 105
 - d. 56
 - e. 84
10. A text can have 9 different fonts, 5 different colors, and 4 different sizes. In how many ways can it be formatted?
- a. 81
 - b. 45
 - c. 270
 - d. 90
 - e. 180

MATHEMATICS FOCUSED QUIZ 2: FACTORIALS

1. Express $\frac{(n+2)!}{(n-1)!}$ in linear form.
 - a. $(n+2)(n+1)(n)$
 - b. $(n+2)(n+1)$
 - c. $(n+2)(n)$
 - d. $(n+2)^2$
 - e. $(n+1)^2$

2. Carl must choose 7 shirts out of 10 to wear during the week, in order. Find the number of possible combinations.
 - a. 302,400
 - b. 604,800
 - c. 100,800
 - d. 50,400
 - e. 120,960

3. Which expression gives the number of ways in which a set of 11 can be ordered?
 - a. 11
 - b. 11!
 - c. $\frac{11!}{2}$
 - d. $\frac{11!}{10!}$
 - e. $11! * 10!$

4. Evaluate $\frac{5!7!}{6!2!}$
 - a. 630
 - b. 210
 - c. 720
 - d. 840
 - e. 420

5. 4 different fidget cubes, 4 different slime boxes, and 3 different coloring books must be displayed in a row, keeping each type of object in a group. How many ways can they be arranged?
 - a. $\frac{11!}{4!4!3!}$
 - b. 11!
 - c. $4!^3$
 - d. $4!4!3!3!$
 - e. $4!3!$

6. 2 fidget cubes have been purchased from the previous set of objects. If the items no longer need to be displayed as a group, how many arrangements are possible?
- 9,0770
 - 181,440
 - 362,880
 - 245,220
 - 9,916,800
7. A fidget cube has a different design on each of its six faces. If each face is labelled A to F, how many ways are there to arrange six designs on the cube?
- 720
 - 120
 - 1,440
 - 60
 - 840
8. Fred is making a jar salad with 5 different ingredients. If he has 8 ingredients to choose from, in how many ways can he order the salad layers?
- 5!
 - $\frac{8!}{3!}$
 - 8!
 - $\frac{8!}{5!}$
 - $\frac{8!}{5!3!}$
9. John purchased a astrology starter pack from Etsy. If there are 5 cards and 3 spells in the pack, in how many ways can he cast the spells and order the cards, assuming these are done separately?
- 720
 - 120
 - 60
 - 540
 - 840
10. Assume a crossover fandom consists of 5 distinct fandoms. How many ways are there to combine the names in order to name the fandom?
- 80
 - 270
 - 180
 - 120
 - 60

MATHEMATICS FOCUSED QUIZ 3: PERMUTATIONS

1. A doctor must rank her top 4 residency choices from 20 options. How many possible lists can she submit?
 - a. 116,280
 - b. 465,180
 - c. 232,560
 - d. 58,140
 - e. 697,740

2. In how many distinct ways can the letters in ULAANBAATAR be arranged?
 - a. 9,979,200
 - b. 332,640
 - c. 997,920
 - d. 3,326,400
 - e. 33,264,000

3. In how many ways can 4 children and 5 adults be seated around a circular table?
 - a. 25,200
 - b. 50,400
 - c. 201,600
 - d. 100,800
 - e. 40,320

4. Assuming $n > 3$, ${}_nP_{n-3} =$
 - a. $n(n-1)(n-2)$
 - b. $\frac{n!}{(n-3)!}$
 - c. $\frac{n!}{3!}$
 - d. $n!$
 - e. $n^2 - n$

5. A garden has 2 rows. The first row has 5 kinds of seeds. The second row has 4 kinds of seeds. In how many ways can the garden be planted?
 - a. 22,880
 - b. 1,440
 - c. 5,720
 - d. 11,440
 - e. 2,880

6. Represent 360 in permutation notation.
- a. ${}_6P_4$
 - b. ${}_6P_3$
 - c. ${}_6P_6$
 - d. ${}_5P_4$
 - e. ${}_5P_3$
7. In how many ways can the letters in ASSIDUOUS be arranged?
- a. 7,560
 - b. 15,120
 - c. 90,720
 - d. 30,240
 - e. 60,480
8. ${}_aP_b \cdot {}_bP_{b-3} =$
- a. ${}_{a+b}P_{a+b-3}$
 - b. ${}_bP_{b-3}$
 - c. ${}_aP_{a-3}$
 - d. ${}_aP_{b-3}$
 - e. ${}_aP_b$
9. Evaluate ${}_6P_5 \times {}_5P_3 \times {}_4P_1$.
- a. 43,200
 - b. 172,800
 - c. 345,600
 - d. 86,400
 - e. 129,600
10. Ted has 5 flavors of protein bars and 5 flavors of coconut water. Assuming he must drink a bottle of coconut water after every protein bar he eats, in how many orders can he consume these items?
- a. 72,576
 - b. 1,451,520
 - c. 725,760
 - d. 14,400
 - e. 3,628,800

MATHEMATICS FOCUSED QUIZ 4: COMBINATIONS

1. In how many ways can 6 books be chosen from a list of 12, if order does not matter?
 - a. 924
 - b. 693
 - c. 375
 - d. 462
 - e. 720

2. $\binom{33}{8}\binom{17}{14}$ has the same value as
 - a. $\binom{33}{25}\binom{25}{3}$
 - b. $\binom{33}{22}\binom{17}{3}$
 - c. $\binom{33}{25}\binom{17}{14}$
 - d. $\binom{33}{25}\binom{17}{3}$
 - e. $\binom{33}{8}\binom{16}{3}$

3. If Snapchat has 20 filters and a maximum of 3 filters can be applied to any given snap, how many combinations of filters can be used?
 - a. 1,140
 - b. 1,351
 - c. 3,420
 - d. 6,840
 - e. 1,710

4. Simplify $\frac{\binom{x}{y}}{\binom{x-1}{y-1}}$.
 - a. $\frac{y}{x}$
 - b. $\frac{x-1}{y-1}$
 - c. $\frac{xy}{x+y}$
 - d. $\frac{x}{y+x}$
 - e. $\frac{x}{y}$

5. A winning hand in mahjong has 14 tiles. In how many ways can these tiles be grouped into 4 groups of 3 and 1 group of 2?
- a. 560,560
 - b. 2,802,800
 - c. 210,210
 - d. 700,700
 - e. 1,401,400
6. In how many ways can a hand of 6 cards be dealt from a deck of 48 cards?
- a. 12,271,512
 - b. 9,203,634
 - c. 6,135,756
 - d. 4,601,817
 - e. 7,362,907
7. Given a selection of n items, the number of ways to select one set of three items followed by one set of two items without replacement is
- a. $\frac{n!}{12(n-3)!(n-2)!}$
 - b. $\frac{n!}{12(n-5)!}$
 - c. $\frac{n!}{5(n-5)!}$
 - d. $\frac{n!}{5(n-12)!}$
 - e. $\frac{n!}{2(n-3)!}$
8. There are 5 types of bread and 8 types of spread. How many possible sandwich combinations can be made with 2 spreads?
- a. 105
 - b. 560
 - c. 280
 - d. 140
 - e. 70

9. Simplify $\binom{x}{x-1}\binom{x-1}{x-2}$.

- a. $2x^2$
- b. $2x - x^2$
- c. $x^2 + 2x + 1$
- d. x^3
- e. $x^2 - x$

10. Which of the following expressions is equal to 168?

- a. $\binom{8}{2}\binom{5}{2}$
- b. $\binom{7}{3}\binom{3}{1}$
- c. $\binom{8}{5}\binom{3}{2}$
- d. $\binom{8}{4}\binom{4}{2}$
- e. $\binom{9}{5}\binom{4}{2}$

MATHEMATICS FOCUSED QUIZ 5: REVIEW OF COUNTING PRINCIPLES

1. In how many distinct ways can the letters in COMMISERATE be arranged?
 - a. 9,979,200
 - b. 8,280,140
 - c. 1,030,984
 - d. 2,060,284
 - e. 6,483,852

2. Express $\binom{9}{5}\binom{4}{2}$ as a permutation.
 - a. $\frac{1}{3}{}_9P_5$
 - b. ${}_9P_5$
 - c. $\frac{2}{3}{}_9P_4$
 - d. $\frac{1}{4}{}_9P_4$
 - e. $\frac{1}{4}{}_9P_3$

3. A group of 6 people must be chosen from 6 men and 6 women. If there must be at least one person of each gender in the group, how many possible groups can be formed?
 - a. 3,688
 - b. 922
 - c. 1,844
 - d. 1,217
 - e. 461

4. In how many ways can eight different flowers be arranged in a wreath?
 - a. 630
 - b. 10,080
 - c. 2,520
 - d. 1,260
 - e. 5,040

5. Find the number of ways to arrange the letters in the word ESTRANGEMENT, if identical letters must be kept together.
 - a. 40,320
 - b. 20,160
 - c. 10,080
 - d. 5,040
 - e. 15,120

6. In how many ways can the word ARRAIGNMENT be arranged so that repeated letters are never together?
- a. 6,302,420
 - b. 8,482,720
 - c. 2,464,140
 - d. 3,851,210
 - e. 4,949,280
7. A regular polygon has n vertices. How many lines can be drawn between two non-adjacent vertices on its interior?
- a. $\frac{n(n-1)}{2}$
 - b. $\frac{n(n-3)}{2}$
 - c. $\frac{n!}{2}$
 - d. $\frac{n(n+1)}{2}$
 - e. $\frac{n(n-3)}{4}$
8. 12 couples meet at an event. Each shakes the hand of every other person at the event besides their spouse. How many handshakes occur?
- a. 728
 - b. 432
 - c. 264
 - d. 528
 - e. 132
9. $\frac{(n+5)!}{7!} =$
- a. $\cdot_{n+5} P_n$
 - b. $\cdot_{n+5} C_{n-2}$
 - c. $\cdot_{n+3} P_{n-2}$
 - d. $\cdot_{n+5} P_{n-2}$
 - e. $\cdot_n P_{n-2}$
10. In how many ways can 6 books and 3 records be chosen from a selection of 8 titles and 5 records?
- a. 280
 - b. 170
 - c. 420
 - d. 540
 - e. 810

MATHEMATICS FOCUSED QUIZ 6: ARITHMETIC SEQUENCES

1. Find the 27th term in the sequence 3, 7, 11, 15...
 - a. 107
 - b. 81
 - c. 89
 - d. 152
 - e. 201

2. Find a_n for a sequence with the 8th term 28 and the 10th term 42.
 - a. $8n + 28$
 - b. $7n + 28$
 - c. $7n - 14$
 - d. $8n - 28$
 - e. $7n - 28$

3. Which of the following sequences is described by $a_{x+1} = a_x + 4$?
 - a. 4, 7, 11, 15...
 - b. 3, 6, 9, 12...
 - c. 2, 6, 10, 14...
 - d. 1, 5, 9, 13...
 - e. 4, 8, 12, 16...

4. Find n if $a_n = 52$ belongs to the sequence 1, 2.5, 4, 5.5, 7...
 - a. 39
 - b. 23
 - c. 17
 - d. 35
 - e. 29

5. Find the 23rd term of a sequence that is given by -8, -4, 0, 4, 8...
 - a. 84
 - b. 60
 - c. 72
 - d. 80
 - e. 64

6. Find $\frac{x}{y}$ in the sequence 3, 7, 11, x ... with y as its 9th term.
- $\frac{9}{24}$
 - $\frac{3}{7}$
 - $\frac{4}{7}$
 - $\frac{21}{42}$
 - $\frac{4}{11}$
7. An arithmetic sequence has terms $a_8 = 14$ and $a_{11} = 35$. Find a_1 .
- 35
 - 4
 - 12
 - 0
 - 28
8. An arithmetic sequence is given by $a_n = -2 + 3(n - 1)$. Which of the following numbers belongs to the sequence?
- 22
 - 26
 - 18
 - 29
 - 15
9. An arithmetic sequence is given by $a_{n+1} = 2$ and $a_{2n+1} = 14$. Express the arithmetic sequence in terms of n .
- $a_n = 2 - \frac{24}{n}$
 - $a_n = 2 + \frac{12}{n}$
 - $a_n = 2\frac{12}{n}$
 - $a_n = 2 - \frac{12}{n}$
 - $a_n = 2 - \frac{12}{2n}$
10. An arithmetic sequence includes the values 5, 27, and 71. By which of the following equations could it be represented?
- $a_n = 5 - 11(n - 1)$
 - $a_n = 11(n - 2)$
 - $a_n = 5 + 11(2n - 1)$
 - $a_n = 11 + 5(n - 1)$
 - $a_n = 5 + 11(n - 1)$

MATHEMATICS FOCUSED QUIZ 7: GEOMETRIC SEQUENCES

1. Which of the following sets is NOT a geometric sequence?
 - a. $2^2, 2, 2^0, 2^{-1}$
 - b. $\frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}$
 - c. $1, 0.5, 0.25, 0.125$
 - d. $\sqrt[2]{7}, \sqrt[3]{7}, \sqrt[4]{7}, \sqrt[5]{7}$
 - e. $2, 4, 8, 16$

2. A geometric sequence starting with 6 is given by $x_{n+1} = \frac{1}{3}x_n$. Find the 5th term in the sequence.
 - a. $\frac{1}{216}$
 - b. $\frac{1}{36}$
 - c. $\frac{1}{432}$
 - d. $\frac{1}{84}$
 - e. $\frac{1}{142}$

3. A geometric sequence has the third term 2 and seventh term 0.125. Express it as a direct formula.
 - a. $2(0.5)^n$.
 - b. $2(0.5)^{n-1}$.
 - c. $2(0.25)^{n-1}$.
 - d. $2(0.5)^{n+1}$.
 - e. $4(0.5)^{n-1}$.

4. Find the direct formula of a sequence given by 3, -6, 12, -24, 48...
 - a. $a_n = (-2)^{n-1}$
 - b. $a_n = 3(-2)^n$
 - c. $a_n = 3(2)^{n-1}$
 - d. $a_n = 3(-2)^{n-1}$
 - e. $a_n = (-2)^n$

5. Express the formula above as a recursive formula.
 - a. $a_n = -2(a_{n-2})$
 - b. $a_{n+1} = -2(a_{n-2})$
 - c. $a_{n+1} = -4(a_n)$
 - d. $a_{n+1} = -2(a_{n-1})$
 - e. $a_{n+1} = -2(a_n)$

6. As which term does $\frac{1}{27}$ appear in the sequence 81, 27, 9...?
- 5th
 - 11th
 - 8th
 - 15th
 - 12th
7. Find a_8 for the series given by the $a_1 = 3$, $a_{n+1} = 2a_n$.
- 384
 - 172
 - 192
 - 97
 - 768
8. Find the geometric series $a_n = a_k a_p$ where $a_k = 2, 4, 8, 16, \dots$ and $a_p = (2)3^{n-1}$.
- $a_n = 6^n 4^n$
 - $a_n = 4(6)^{n-1}$
 - $a_n = 6(6)^{n-1}$
 - $a_n = (4 \cdot 6)^{n-1}$
 - $a_n = 4 + 6^{n-1}$
9. Find the recursive formula for the series given by $\frac{3^n}{4}$.
- $a_1 = 1.5, a_{n+1} = a_n^{3/4}$
 - $a_1 = \sqrt{3/4}, a_{n+1} = 3/4^{n/2}$
 - $a_1 = \frac{3}{4}n, a_{n+1} = \frac{3}{4}n$
 - $a_1 = \frac{3}{4}, a_{n+1} = \frac{3}{4}a_n$
 - $a_1 = \frac{9}{8}, a_{n+1} = \frac{3^{a_{n-1}}}{4}$
10. A sequence includes 1, $\sqrt{2}$, 2, $2\sqrt{2}$ It does NOT include
- $5\sqrt{2}$
 - $4\sqrt{2}$
 - $\frac{1}{\sqrt{2}}$
 - $\frac{1}{2\sqrt{2}}$
 - $\frac{1}{2}$

MATHEMATICS FOCUSED QUIZ 8: SUMS OF ARITHMETIC SEQUENCES

1. Find $-9 + -3 + 3 + 9 + 15 \dots + 51$.
 - a. 231
 - b. 384
 - c. 312
 - d. 385
 - e. 296

2. Find $\sum_{k=1}^{24} 28 + 12(k - 2)$.
 - a. 7,392
 - b. 2,800
 - c. 2,342
 - d. 3,696
 - e. 1,848

3. Simplify $\sum_{n=3}^{10} xn + y$.
 - a. $53x + 3y$
 - b. $51x + 19y$
 - c. $52x + 8y$
 - d. $54x + 8y$
 - e. $57x + 19y$

4. Simplify $\sum_{n=k}^{k+12} 6n - 3$.
 - a. $60k - 36$
 - b. $80k + 429$
 - c. $24k + 30$
 - d. $6k + 33$
 - e. $72k - 30$

5. Find the sum of the first 18 terms of the sequence $a_1 = 50, a_n = a_{n-1} - 6$.
 - a. 18
 - b. 22
 - c. 6
 - d. -27
 - e. -18

6. Evaluate $\sum_{n=1}^9 4n + 3$.
- 207
 - 233
 - 250
 - 210
 - 253
7. Find $52 + 48 + 44 \dots + 0 + -4 + -8$.
- 520
 - 176
 - 364
 - 722
 - 352
8. Express the sum of numbers from 5 to x .
- $\frac{x^2+x}{2}$
 - $\frac{x^2}{2}$
 - $\frac{x^2+x-20}{2}$
 - $\frac{x^2+x}{2} + 10$
 - $\frac{x^2}{2} + 6$
9. Evaluate the sum of the 1st to 20th terms of the series given by $a_n = 6 + 14(k - 2)$.
- 5000
 - 625
 - 1250
 - 2500
 - 3250
10. Evaluate $\sum_{n=2}^{12} 2n + 2$.
- 85
 - 88
 - 176
 - 184
 - 179

MATHEMATICS FOCUSED QUIZ 9: SUMS OF GEOMETRIC SERIES

1. Evaluate $\sum_{n=1}^7 2 \times 1.5^n$.

- a. 151.2
- b. 325.6
- c. 96.5
- d. 122.4
- e. 254.8

2. $\sum_{n=1}^x 3(2)^n = 1530$. Find x .

- a. 6
- b. 5
- c. 11
- d. 9
- e. 8

3. $\sum_{n=1}^x 24\left(\frac{1}{4}\right)^n =$

- a. 15
- b. 14
- c. 6
- d. 8
- e. 11

4. Find t if $\sum_{n=1}^{\infty} 12t^n = 84$.

- a. $7/8$
- b. $4/5$
- c. $3/4$
- d. $3/8$
- e. $5/8$

5. $\sum_{t=n}^{n+6} xy^t =$

- a. $xy^n \frac{y^8-1}{y-1}$
- b. $xy \frac{y^7-1}{y-1}$
- c. $xy^n \frac{y^7-1}{y-1}$
- d. $x \frac{y^7-1}{y-1}$
- e. $xy^{n-1} \frac{y^7-1}{y-1}$

6. Evaluate $39,366 + 13,122 + 4,374 + \dots$
- 216,192
 - 108,096
 - 72,153
 - 59,049
 - 432,384
7. Express the above series in sigma notation.
- $\sum_{n=1}^{\infty} (2 \times 3^{10} \times \left(\frac{1}{3}\right)^n)$
 - $\sum_{n=2}^{\infty} (2 \times 3^{10} \times \left(\frac{1}{3}\right)^n)$
 - $\sum_{n=1}^{\infty} (2 \times 3^9 \times \left(\frac{1}{3}\right)^n)$
 - $\sum_{n=1}^{\infty} (3^{10} \times \left(\frac{1}{3}\right)^n)$
 - $\sum_{n=1}^{\infty} (2 \times 3^{10} \times \left(\frac{1}{3}\right)^{n-1})$
8. Find a if $\sum_{n=2}^6 3a^n = 167,940$
- 9
 - 4
 - 8
 - 3
 - 6
9. Find n if $\sum_{k=2}^n 3(4)^k = 262,128$.
- 7
 - 14
 - 8
 - 11
 - 6
10. Evaluate the series $\sum_{k=3}^8 3^k 2^{k+1}$.
- 4,030,992
 - 2,050,481
 - 8,061,884
 - 1,025,240
 - 16,123,768

MATHEMATICS FOCUSED QUIZ 10: REVIEW OF SEQUENCES AND SERIES

1. Evaluate $4 + 10 + \dots + 40$.
 - a. 154
 - b. 295
 - c. 147
 - d. 442
 - e. 120

2. $\sum_{n=1}^t 4^{2n} = 1530$. Find t .
 - a. 6
 - b. 2
 - c. 8
 - d. 9
 - e. 5

3. $\sum_{n=1}^{\infty} \left(\frac{2}{3}\right)^n \left(\frac{1}{4}\right)^n =$
 - a. 0.4
 - b. 0.128
 - c. 0.2
 - d. 0.33
 - e. 0.66

4. Find the sum of the first 15 terms of the series $a_1 = 4, a_{n+1} = 2a_n$.
 - a. 321,204
 - b. 182,136
 - c. 65,534
 - d. 32,767
 - e. 131,068

5. $\sum_{n=1}^{\infty} y^{-n} =$
 - a. y^n
 - b. $\frac{1}{y^2-1}$
 - c. $\frac{1}{y}$
 - d. $\frac{1}{y-1}$
 - e. $y \frac{y^2-1}{y-1}$

6. A series includes the consecutive terms 23, 27, 31, 35.... Find a_1 if $a_1 > 0$ and a_n .
- $3; 4(n+1)$
 - $2; 4(n-1)$
 - $3; 4n-1$
 - $4; 4n$
 - $4; 4n + 2$
7. Express the series $9\sqrt{3}, 9, 3\sqrt{3}, 3, \sqrt{3} \dots$ in sigma notation.
- $\sum_{n=1}^{\infty} 9\left(\frac{1}{\sqrt{3}}\right)^n$
 - $\sum_{n=1}^{\infty} 27\left(\frac{1}{\sqrt{3}}\right)^n$
 - $\sum_{n=1}^{\infty} 27\left(\frac{1}{3}\right)^n$
 - $\sum_{n=1}^{\infty} 27\left(\frac{1}{\sqrt{3}}\right)^{n-1}$
 - $\sum_{n=1}^{\infty} 9\left(\frac{1}{3}\right)^n$
8. $\sum_{n=2}^5 \left(\frac{1}{a}\right)^n = 60$. Find a .
- $\frac{1}{2}$
 - $\frac{3}{4}$
 - $\frac{2}{3}$
 - $\frac{3}{2}$
 - 2
9. Find the sum of the series $1, \frac{3}{4}, \frac{9}{16}, \frac{27}{48} \dots$
- 7
 - 5
 - 8
 - 11
 - 4
10. Find the sum of the series $\sum_{n=1}^5 2^{-n} 6^{n+2}$.
- 40,281
 - 20,048
 - 13,176
 - 1,030,240
 - 160,768

MATHEMATICS FOCUSED QUIZ 11: ADDING AND SUBTRACTING POLYNOMIALS

1. Express $\sum_{n=0}^3 (5 \left(\frac{1}{2}\right)^n x^{2n})$ as a polynomial.
 - a. $\frac{5}{8}x^6 + \frac{5}{4}x^4 + \frac{5}{2}x^2 + 5$
 - b. $\frac{5}{4}x^6 + \frac{5}{2}x^4 + 5x^2 + 10$
 - c. $\frac{5}{8}x^4 + \frac{5}{4}x^2 + \frac{5}{2}x + 5$
 - d. $\frac{5}{8}x^4 + \frac{5}{4}x^3 + \frac{5}{2}x^2 + 5x$
 - e. $\frac{5}{2}x^6 + \frac{5}{4}x^4 + \frac{5}{8}x^2$

2. Express $\sum_{n=0}^3 ((5 + 10n)x^n)$ as a polynomial.
 - a. $10x + 20x^2 + 25x^3$
 - b. $5 + 10x + 20x^2 + 30x^3$
 - c. $5x + 15x^2 + 25x^3$
 - d. $5 + 15x + 25x^2 + 35x^3$
 - e. $15 + 20x^2 + 25x^4$

3. Express $(3x^3 + x^2)(2x - 10x^2)$ as a single polynomial.
 - a. $-30x^3 - 4x^2 + x$
 - b. $-30x^5 - 4x^4 + 2x^3$
 - c. $30x^5 + 4x^4 + 2x^3$
 - d. $-30x^5 + 8x^4 + 4x^3$
 - e. $-30x^5 - 4x^4 + 8x^3 + 4x^2$

4. Simplify $\sum_{n=1}^3 (2 + 6n)x^n + \sum_{n=1}^3 (5 - n)x^n$.
 - a. $6 + 17x + 22x^2$
 - b. $6x + 15x^2 + 22x^3$
 - c. $12 + 17x + 22x^2$
 - d. $12x + 18x^2 + 24x^3$
 - e. $12x + 17x^2 + 22x^3$

5. $9x + 8x^2 + 6x^3 = 2x(x - 5) + Bx(x^2 + 2x)$. Find B.
 - a. 15
 - b. 12
 - c. 9
 - d. 8
 - e. 6

6. $Ax^2 + Bx + C - (Cx^2 + Bx - B) = 2x^2 + 10$. Find $A + B$.
- 12
 - 10
 - 14
 - 8
 - 11.5
7. Express $\frac{5}{4}x^2 + \frac{5}{2}x + 5$ in sigma notation.
- $\sum_{n=0}^3 5\left(\frac{1}{2}\right)^n x^n$
 - $\sum_{n=0}^2 5\left(\frac{1}{2}\right)^n x^n$
 - $\sum_{n=1}^2 5\left(\frac{1}{2}\right)^n x^n$
 - $\sum_{n=0}^2 5\left(\frac{1}{2}\right)^n x^n$
 - $\sum_{n=1}^2 5^{n-1}\left(\frac{1}{2}\right)^n x^n$
8. Simplify $\sum_{n=1}^4 2n + 2^n x^n$
- $16x^4 + 4x^3 + x^2 + x + 20$
 - $16x^4 - 8x^3 + 4x^2 - 2x + 10$
 - $8x^4 + 4x^3 + 2x^2 + x + 20$
 - $16x^4 + 8x^3 + 4x^2 + 2x + 20$
 - $x^4 + 2x^3 + 4x^2 + 8x + 20$
9. Simplify $\sum_{n=1}^3 (5 + 3n)x^n + \sum_{n=0}^2 (4 - 6n)x^{n+1}$.
- $6x^3 + 3x^2$
 - $18x^2$
 - $6x^3 + 9x^2 + 12x$
 - $3x + 6x^2$
 - $6x - 3x^2$
10. Express $\sum_{k=0}^3 27\left(\frac{2}{3}\right)^k x^k$ as a polynomial.
- $18x^3 + 9x^2 + 6x + 2$
 - $9x^3 + 18x^2 + 27 + 36$
 - $8x^3 + 27x^2 + 18x + 27$
 - $8x^3 + 16x^2 + 24 + 32$
 - $27x^3 + 18x^2 + 12x + 8$

MATHEMATICS FOCUSED QUIZ 12: MULTIPLYING POLYNOMIALS

1. $x + y = 25$ and $x - y = 8$. Find $x^2 + 2x - 2y - y^2$.
 - a. 92
 - b. 182
 - c. 216
 - d. 166
 - e. 108

2. Find the coefficient of x^3 in the expanded form of $(4x^2 + 3)(5x + 1)(2x^2 - 1)$.
 - a. 3
 - b. 6
 - c. 7
 - d. 10
 - e. 12

3. $x + y = 12$ and $x - y = 4$. Find xy .
 - a. 16
 - b. 32
 - c. 36
 - d. 28
 - e. 18

4. $(ax^2 + bx)(x - 3) + (x^2 + ax)(x + 3) = 7x^3 - 8x^2 + 12x$. Find $a + b$.
 - a. 2
 - b. 17
 - c. 3
 - d. 11
 - e. 10

5. Simplify $(2x^3 + 4x)(4x^3 + 2x)$.
 - a. $20x^6 + 20x^4 + 8x^2$
 - b. $20x^6 + 8x^4 + 16x^2$
 - c. $18x^6 + 20x^4 + 18x^2$
 - d. $16x^6 + 20x^4 + 16x^2$
 - e. $8x^6 + 20x^4 + 8x^2$

6. Simplify $(x - 1)(x^2 - x)(x + 1)$.
- $x^4 + x^3 + x^2 + x$
 - $x^4 - x^3 - x^2 + x$
 - $x^4 - x^3 + x$
 - $x^4 - 2x^3 - x$
 - $x^4 + 2x^2 + x$
7. $(Ax - B)(x - 2) = Cx^2 + 4$. Find C .
- 2
 - 3
 - 1
 - 1
 - 2
8. $4x^2 + Ax + B = (2x + C)^2$. Which of the following expressions is true?
- $A = 2C$
 - $B = 8$
 - $C = \left(\frac{A}{2}\right)^2$
 - $B = \left(\frac{C}{4}\right)^2$
 - $B = \left(\frac{A}{4}\right)^2$
9. $(x^2 - 1)(x^2 - 2x + 1) =$
- $(x + 1)^2(x - 1)^2$
 - $(x + 1)(x - 1)^2$
 - $(x + 1)(x - 1)^3$
 - $(x + 1)^4$
 - $(x - 1)^4$
10. Simplify $(6x + 5)(x + 1)^2$.
- $5x^3 + 17x^2 + 11x + 5$
 - $2x^3 + 11x^2 + 16x + 5$
 - $2x^3 + 17x^2 + 14x + 9$
 - $6x^3 + 17x^2 + 16x + 5$
 - $6x^3 + 12x^2 + 14x + 9$

MATHEMATICS FOCUSED QUIZ 13: BINOMIAL EXPANSION

1. Find the coefficient of the x^4 term of $(6x + 3)^8$.
 - a. 176,359,680
 - b. 2,939,328
 - c. 7,348,320
 - d. 104,796
 - e. 272,160

2. Express $(4x - 3)^9$ in sigma notation.
 - a. $\sum_{n=0}^9 \binom{9}{n} (4x)^n (3)^{9-n}$
 - b. $\sum_{n=0}^{10} \binom{10}{n} (x)^n (-3)^{9-n}$
 - c. $\sum_{n=0}^9 2 (4x)^n (-3)^{9-n}$
 - d. $\sum_{n=0}^9 \binom{9}{n} (4x)^n (-3)^{9-n}$
 - e. $\sum_{n=0}^9 \binom{9}{n} (x)^n (3)^{9-n}$

3. Express $\sum_{n=0}^7 (2x^2)^{7-n} 3^n$ as a binomial.
 - a. $(2x^2 + 3)^8$
 - b. $(2x^2 + 3)^7$
 - c. $(2x^2 - 3)^7$
 - d. $(2x^2 + \sqrt{3})^7$
 - e. $(\sqrt{2}x^2 + 3)^7$

4. Find the coefficient of the x^4 term in $\sum_{a=0}^8 \binom{8}{a} (2x)^{8-a} 3^a$.
 - a. 83,120
 - b. 181,440
 - c. 45,360
 - d. 22,850
 - e. 90,720

5. Express $(2x^2 + 4)^8$ in sigma notation.

- a. $\sum_{n=0}^8 \binom{8}{n} (x^2)^{8-n} 4^n$
- b. $\sum_{n=0}^8 \binom{8}{8-n} (2x^2)^{8-n} 4^{8-n}$
- c. $\sum_{n=0}^8 \binom{8}{n} (2x^2)^{8-n} 4^{8-n}$
- d. $\sum_{n=1}^8 \binom{8}{n-1} (2x^2)^{8-n} 4^n$
- e. $\sum_{n=0}^8 \binom{8}{n} (2x^2)^{8-n} 4^n$

6. Find the coefficient of the x^4 term of $(x^2 - 2)^7$.

- a. -336
- b. 336
- c. -672
- d. 672
- e. 448

7. Expand $(4x - 2)^4$.

- a. $256x^4 - 512x^3 + 384x^2 - 128x + 16$
- b. $256x^4 - 84x^3 + 424x^2 - 88x + 16$
- c. $128x^4 + 128x^3 + 384x^2 - 128x + 16$
- d. $128x^4 + 128x^3 - 384x^2 + 128x - 16$
- e. $128x^4 - 264x^3 + 256x^2 - 128x + 16$

8. Find the coefficient of the x^5 term in the polynomial represented by

$$\sum_{n=0}^{10} \binom{10}{n} (3x)^{10-n} (2)^n.$$

- a. 1,456,282
- b. 1,959,552
- c. 458,932
- d. 802,832
- e. 628,480

9. Express $\sum_{n=0}^{12} \binom{12}{n} (x^2)^{12-n} (-3)^n$ as a binomial.

- a. $(x^2 - 3)^9$
- b. $3(x^2)^{12}$
- c. $(3x^2)^{12}$
- d. $(x^2 - 3)^{12}$
- e. $(x^2 + 3)^{12}$

10. Expand $(2x^2 - 1)^3$.

- a. $8x^6 - 12x^4 - 6x^2 + 2$
- b. $4x^6 - 12x^4 + 2x^2 + 1$
- c. $8x^6 + 2x^4 - 6x^2 + 1$
- d. $8x^6 + 2x^5 - 12x^4 - 2x^3 + 6x^2 + 1$
- e. $8x^6 - 12x^4 + 6x^2 + 1$

MATHEMATICS FOCUSED QUIZ 14: REVIEW OF POLYNOMIALS

1. Expand $x^3y^2(x + y)^{12}$.
 - a. $\sum_{n=0}^{15} \binom{15}{n} x^{n+3} y^{15-n}$
 - b. $\sum_{n=0}^{12} \binom{12}{n} x^{n+3} y^{14-n}$
 - c. $\sum_{n=0}^{12} \binom{15}{n} x^{n+3} y^{14-n}$
 - d. $\sum_{n=0}^{12} \binom{15}{n} x^n y^{14-n}$
 - e. $\sum_{n=0}^{12} \binom{15}{n} x^n y^{14+n}$

2. Find the sum of coefficients in the expansion of $(x - 2y)^5$.
 - a. 3
 - b. 0
 - c. 4
 - d. -1
 - e. 2

3. Find $(\sum_{n=0}^2 2^n x^n) (\sum_{n=0}^2 (-1)^n x^n)$.
 - a. $1 + x - 3x^2 + 2x^3 - 4x^4$
 - b. $1 + x + 3x^2 - 2x^3 + 4x^4$
 - c. $2 + 2x + 6x^2 - 4x^3 + 8x^4$
 - d. $2 + 2x - 6x^2 + 4x^3 + 8x^4$
 - e. $2 + 3x + 6x^2 - 9x^3 + 8x^4$

4. The coefficient of x^3 in $(x - 1)(x^3 - nx + 3)(1 - x^2)$ is 1. Find n .
 - a. -2
 - b. 5
 - c. 2
 - d. 4
 - e. -5

5. The coefficient of x^4 in $(nx - 1)^7$ is -2835. Find n .
 - a. -3
 - b. 1
 - c. 3
 - d. -2
 - e. 4

6. $(mx - n) + (nx + m) = 3x + 9$. Find $n^2 - m^2$.
- 27
 - 15
 - 9
 - 12
 - 3
7. Express $\sum_{n=0}^2 3^n x^{2n} + 3n$ as a polynomial.
- $1 + 3x^2 + 9x^4$
 - $10 + 4x^2 + 2x^4$
 - $5 + 10x + 3x^2 + 9x^4$
 - $10 + 3x^2 + 9x^4$
 - $9 + 3x^2 + 1x^4$
8. Find the coefficient of the x^8 term of $(3x^2 - 2)^{12}$.
- 1,288,040
 - 2,576,080
 - 5,132,160
 - 644,020
 - 10,264,320
9. Expand $(mx^2 - nx + p)(px^2 - mx + n)$.
- $mpx^4 - (m^2 + np)x^3 + (2mn)x^2 - (n^2 - mp)x + np$
 - $mnp x^4 - (m^2 - np)x^3 + p^2 x^2 - (n^2 + mp)x + p$
 - $mpx^4 - m^2 x^3 + p^2 x^2 - (n^2 + mp)x + np$
 - $mpx^4 - (m^2 + np)x^3 + (2mn + p^2)x^2 - (n^2 + mp)x + np$
 - $(m - n)px^4 - (m^2 - np)x^3 + 2mnx^2 - n^2 x + np$
10. Express $(3x^4 + 4x^2)^{11}$ as sigma notation.
- $\sum_{n=0}^{11} \binom{11}{n} 3(x^4)^{11-n} (4x^2)^n$
 - $\sum_{n=1}^{12} \binom{11}{n} (3x^4)^{11-n} (4x^2)^n$
 - $\sum_{n=0}^{11} \binom{11}{n} (3x^4)^{11-n} (4x^2)^n$
 - $\sum_{n=0}^{11} \binom{11}{n} (x^4)^{11-n} (x^2)^n$
 - $\sum_{n=0}^{11} \binom{11}{n} 12(x^4)^{11-n} (x^2)^n$

MATHEMATICS FOCUSED QUIZ 15: SIMPLE AND COMPOUND INTEREST

1. Find the amount of interest paid on a loan of \$2000 if it is repaid over three years at a simple interest rate of 4% annually.
 - a. \$155
 - b. \$120
 - c. \$480
 - d. \$320
 - e. \$240

2. Find the payout of an investment of \$600 that earns 2.5% interest compounded monthly for 2 years.
 - a. \$520.34
 - b. \$630.73
 - c. \$128.92
 - d. \$332.84
 - e. \$423.52

3. \$200 is invested into an account that earns 3% annual interest, compounded monthly. After how many full years will it have earned \$200 in interest?
 - a. 31
 - b. 24
 - c. 27
 - d. 13
 - e. 17

4. An account has an annual compound interest rate of 4% a year. How much should be deposited to have \$200,000 after 30 years?
 - a. \$68,632
 - b. \$41,332
 - c. \$143,013
 - d. \$42,635
 - e. \$61,664

5. \$5000 is divided between two accounts. The first earns 3% annual interest compounded monthly, and the second earns 4% annual interest compounded quarterly. What is the difference in the value of each account after 10 years?
 - a. \$793
 - b. \$698
 - c. \$934
 - d. \$804
 - e. \$457

6. \$3,000 is deposited into an account that compounds semi-annually at 4.5% annual interest rate. How much will it be worth after 50 years?
- a. \$23,421
 - b. \$29,512
 - c. \$27,762
 - d. \$30,613
 - e. \$31,201
7. A sum of money earns 3.7% interest compounded quarterly. After how many full years will its value double?
- a. 15
 - b. 21
 - c. 23
 - d. 19
 - e. 17
8. \$3,605 is withdrawn from an account that gave 5% interest compounded semi-annually for 10 years. How much was initially deposited?
- a. \$2,200
 - b. \$2,052
 - c. \$1,025
 - d. \$1,625
 - e. \$1,850
9. How much more is earned by investing \$1,500 for 10 years at an interest rate of 5% compounded annually than investing the same amount, for the same period, with simple interest?
- a. \$423
 - b. \$93
 - c. \$521
 - d. \$193
 - e. \$342
10. In 10 years, \$3,300 grows to \$9,322.50. What is the annual compound interest rate?
- a. 9.1%
 - b. 8.1%
 - c. 10.9%
 - d. 11.2%
 - e. 12.1%

MATHEMATICS FOCUSED QUIZ 16: ANNUITIES AND LOANS

1. After how many months will an annuity earning 2.4% annually be worth \$500 if \$25 is deposited monthly?
 - a. 16
 - b. 20
 - c. 24
 - d. 28
 - e. 32

2. \$35 is deposited into an account each month with an interest rate of 4.8% compounded monthly. Find the amount of money in the account after 5 years.
 - a. \$2,772
 - b. \$3,696
 - c. \$1,848
 - d. \$2,368
 - e. \$1,352

3. A loan worth \$15,000 is charged 3.7% annual interest over four years. How much will bimonthly payments of the loan be?
 - a. 245.12
 - b. 168.22
 - c. 345.42
 - d. 125.46
 - e. 250.92

4. A loan is paid off in 5 years with a monthly payment of \$125 and an interest rate of 4.1% compounded monthly. How much is the initial sum?
 - a. \$5790.27
 - b. \$4363.68
 - c. \$4782.51
 - d. \$5214.62
 - e. \$6770.76

5. An annuity has a deposit of \$50 per month and a value of \$10,000 after 8 years. What interest rate does it offer?
 - a. 11.634%
 - b. 9.405%
 - c. 15.202%
 - d. 7.452%
 - e. 16.809%

6. A sum of money is deposited in an account earning 4.5% per year. \$1,500 is withdrawn each year for the next 20 years, emptying the account. How much was initially deposited?
- a. 22,514
 - b. 21,032
 - c. 19,512
 - d. 18,932
 - e. 23,546
7. A loan of \$6,500 is given at 7.2% annual interest. If it is paid back monthly over five years, how much is paid each month?
- a. 107.43
 - b. 111.45
 - c. 115.75
 - d. 129.32
 - e. 123.23
8. A student takes out a 30-year college loan with an interest rate of 4% compounded monthly. If the cost of tuition is \$245,500, how much is the monthly repayment?
- a. 1172
 - b. 1001
 - c. 963
 - d. 925
 - e. 891
9. A credit card has a \$3,000 credit limit with 6.3% APR. If the card is maxed out and must be paid off within six months, what is the minimum monthly payment?
- a. 732.63
 - b. 421.62
 - c. 607.21
 - d. 302.35
 - e. 509.22
10. An account earning 3.2% annual interest contains 1 million dollars. If a fixed amount of money is withdrawn yearly for 50 years, what is the maximum amount that can be withdrawn?
- a. \$46,291.63
 - b. \$37,294.29
 - c. \$40,354.39
 - d. \$52,620.76
 - e. \$31,425.31

MATHEMATICS FOCUSED QUIZ 17: EULER'S CONSTANT

1. Find $\sum_{k=-1}^{\infty} \frac{12}{(k+1)!}$
 - a. $12e$
 - b. $6e^2$
 - c. $0.5e$
 - d. $24e$
 - e. $3e^2$

2. Find $\lim_{n \rightarrow \infty} \left(1 + \frac{3}{n}\right)^n$.
 - a. $3e+1$
 - b. $\frac{e}{3}$
 - c. $3e$
 - d. e^3
 - e. $(3e)^2$

3. An account with \$30,000 has a constantly compounded interest rate of 6%. How much money will be in the account after 6 years?
 - a. 35,550
 - b. 43,000
 - c. 34,000
 - d. 53,550
 - e. 43,550

4. A radioactive compound has a half-life of 2.3 minutes. How much of a 5g sample of the compound will remain after 9 minutes?
 - a. 0.643 g
 - b. 0.223 g
 - c. 0.113 g
 - d. 0.532 g
 - e. 0.332 g

5. In how many years will an investment double if placed into an account that earns 3.2% compounded continuously?
 - a. 27.24
 - b. 12.62
 - c. 21.66
 - d. 15.87
 - e. 51.34

6. Which of the following choices is equivalent to $\sum_{k=0}^{\infty} \frac{1}{k!}$?
- a. $\lim_{n \rightarrow \infty} \left(1 + \frac{8}{n!}\right)^{\frac{n}{8}}$
 - b. $\lim_{n \rightarrow \infty} \left(1 + \frac{8}{n^2}\right)^{\frac{n}{8}}$
 - c. $\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^{\frac{n}{8}}$
 - d. $\lim_{n \rightarrow \infty} \left(1 + \frac{8}{n}\right)^n$
 - e. $\lim_{n \rightarrow \infty} \left(1 + \frac{8}{n}\right)^{\frac{n}{8}}$
7. A population of 2,525 increases by 40% each year. What will the population be in 23 months?
- a. 4,808
 - b. 5,838
 - c. 5,201
 - d. 4,220
 - e. 4,481
8. \$10,000 is deposited in a continuously compounded account. After 12 years, it has grown in value by 40%. Find the interest rate.
- a. 3.5%
 - b. 2.8%
 - c. 4.2%
 - d. 2.6%
 - e. 3.1%
9. A sum of money, $\$N$ is deposited in an account with continuously compounded interest rate p . After t years, the money is worth $\$M$. Express e^{pt} in terms of M and N .
- a. $M+N$
 - b. MN
 - c. $\frac{M+N}{N}$
 - d. $\frac{N}{M}$
 - e. $\frac{M}{N}$
10. A population depletes at an exponential rate such that 20% is depleted every 2 hours. After how many hours will it be 95% depleted?
- a. 21.72
 - b. 35.21
 - c. 26.85
 - d. 31.82
 - e. 29.34

MATHEMATICS FOCUSED QUIZ 18: REVIEW OF FINANCES AND EULER'S CONSTANT

1. Which of the following interest rate structures offers the HIGHEST interest?
 - a. 4.6% compounded continuously
 - b. 4.7% compounded monthly
 - c. 4.8% compounded quarterly
 - d. 4.9% compounded biannually
 - e. 5.0% compounded annually

2. \$95 is placed every week for 20 years in an annuity that earns 5.1% APR. How much is it worth after 20 years?
 - a. \$112,351
 - b. \$80,263
 - c. \$171,622
 - d. \$92,531
 - e. \$235,829

3. Two accounts are opened with \$50,000 each. The first has 5.1% APR compounded annually and the second 4.9% APR compounded 16 times per year. Find the difference in the accounts' value after 8 years.
 - a. \$242
 - b. \$485
 - c. \$235
 - d. \$582
 - e. \$173

4. \$60,000 is placed in an account that compounds semi-annually. The account is worth twice the initial deposit after 8 years. Find its interest rate.
 - a. 9.1%
 - b. 4.45%
 - c. 2.85%
 - d. 7.233%
 - e. 8.855%

5. \$17,000 is loaned for six years at 8.1% annual interest. If it is repaid monthly, how much must be paid per month?
 - a. 279
 - b. 277
 - c. 299
 - d. 303
 - e. 301

6. \$200 is invested in an account earning 4% compounded quarterly. After 6 years, the account earns 3.6% compounded monthly instead. Find the value of the account after 15 years.
- 350.95
 - 294.52
 - 458.34
 - 301.52
 - 413.52
7. \$225 is placed per month into an annuity earning 5.3% APR. After how many years will the annuity be worth \$10,000?
- 3.983
 - 3.389
 - 4.398
 - 4.289
 - 4.893
8. \$2,000 compounded indefinitely at 1% APR will be approximately worth
- \$3,572
 - \$7,425
 - \$7,453
 - \$5,437
 - \$4,573
9. $(\sum_{k=0}^{\infty} \frac{2}{k!})(\sum_{k=0}^n \binom{n}{k} \frac{1}{n^k}) =$
- $\frac{e^2}{2}$
 - $2e$
 - $4e$
 - $2e^2$
 - e^2
10. An annuity earns 2.4% APR. How much must be invested per week for it to be worth \$6472 after a year?
- 123
 - 192
 - 228
 - 237
 - 342

MATHEMATICS FOCUSED QUIZ 19 – MEAN, MEDIAN, AND MODE

1. A dataset $\{-2, 5, -4, x, y, 2x\}$ has a mean of 3 and a mode of -2. Find possible $x + y$.
 - a. -6
 - b. -2
 - c. 2
 - d. 8
 - e. 10

2. A dataset has 17 elements and a median of 23. $\{15, 21, 24, 30\}$ is added to the data set. Find the new median.
 - a. 15
 - b. 24
 - c. 21
 - d. 23
 - e. 30

3. Find $\{mean - median\}$ of the data set $\{12, 84, 38, 23, 59, 30\}$.
 - a. 5
 - b. 7
 - c. 12
 - d. 8
 - e. 6

4. A data set with 10 elements has a mean of 81.5. If $\{71, 83, 92\}$ is added to it, find the new mean.
 - a. 78.0
 - b. 85.6
 - c. 83.0
 - d. 92.0
 - e. 81.6

5. A dataset $\{x_n\}$ is such that $\sum_{n=1}^{12} x_n = 114$. Find its mean.
 - a. 8.3
 - b. 10.2
 - c. 9.5
 - d. 11.4
 - e. 9.2

6. The mode and the median of the data set $\{2, 4, 7, 8, 11, 11, x, x\}$ are equal. x can be
- 18
 - 15
 - 12
 - 8
 - 6
7. The data set $\{-11, 3, -2, 8, 10, -5, -6, 4, 5, x\}$ has a median of 2. Find x .
- 2
 - 5
 - 2
 - 1
 - 3
8. Find the mean of the set $\{1, 10, 9, 8, 2, x\}$ with median 7.
- 6
 - 5
 - 4
 - 7
 - 2
9. Which of the following data sets has the same mean, median, and mode?
- $\{-1, 3, 4, 5, 6, 7\}$
 - $\{-1, -1, 2, 3, 4, 6\}$
 - $\{1, 3, 4, 6, 8, 10\}$
 - $\{1, 2, 3, 4, 5, 5\}$
 - $\{-1, 3, 4, 4, 5, 9\}$
10. Find the largest value amongst the mean, median, mode of the data set $\{3, 5, 7, 2, 4, 8\}$.
- 7.17
 - 8.33
 - 4.83
 - 3.50
 - 5.50

MATHEMATICS FOCUSED QUIZ 20: RANGE, QUARTILES, AND IQR

1. The IQR of $\{x, 4, 8, 10, 11, 12, 13, 15\}$ is 5. x must be
 - a. between 10 and 20
 - b. less than 30
 - c. between 10 and 30
 - d. more than 15
 - e. more than 20

2. A dataset has IQR of 12 and 2 outliers at either extreme. Find its minimum range if $Q1 = x$.
 - a. $2x + 12$
 - b. $x - 12$
 - c. $x + 48$
 - d. 48
 - e. $x + 96$

3. Find the IQR of $\{2, 3, 5, 8, 10, 11, 12, 13, 14, 21, x\}$ if $8 \geq x \geq 5$.
 - a. $x + 13$
 - b. 8
 - c. $13 - x$
 - d. 4
 - e. $x - 5$

4. Sum the outliers of the data set $\{32, 22, 46, 64, 34, 43, 52, 74, 21\}$.
 - a. 43
 - b. 74
 - c. 95
 - d. 107
 - e. 0

5. The range of the dataset $\{2, 8, 9, 11, 20, 32, x, y\}$ is 40. Which of the following sets can represent $\{x, y\}$?
 - a. $\{1, 42\}$
 - b. $\{-8, 34\}$
 - c. $\{36, -4\}$
 - d. $\{44, 8\}$
 - e. $\{50, 2\}$

6. A particular dataset has an IQR of 20 and exactly two outliers at either extreme. Find its minimum range.
- 160
 - 40
 - 60
 - 80
 - 100
7. Which of the following datasets has the same median as {1, 5, 2, -5, 7, 3, 10}?
- {1, 2, 3, 4, 5, 6}
 - {-3, -1, 1, 3, 5, 7}
 - {1, 3, 5, 7, 9}
 - {2, 4, 6, 8, 10}
 - {1, 2, 2, 4, 5, 6}
8. A dataset has no outliers and its IQR is 15. Which of the following datasets can it be?
- {1, 3, 4, 5, 7, 11, 13, 14, 19, 23, 32}
 - {2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22}
 - {-20, -15, 3, 4, 5, 8, 10, 12, 17, 25, 31}
 - {-14, -10, 6, 10, 12, 13, 14, 16, 20, 37, 43}
 - {-21, -14, -7, 0, 7, 14, 21, 28, 35, 42, 49}
9. Find the IQR of the data set given by the terms in the series expansion of $\sum_{n=1}^9 2n + 1$.
- 18
 - 10
 - 21
 - 30
 - 20
10. Find the possible values of outliers in the dataset given above.
- $x < -51$ and $x > 51$
 - $x < -19$ and $x > 41$
 - $x < -9$ and $x > 31$
 - $x < -20$ and $x > 24$
 - $x < 11$ and $x > 51$

MATHEMATICS FOCUSED QUIZ 21: VARIANCE

1. A dataset has variance 8. Every element is doubled. Find the new variance.

- a. 18
- b. 28
- c. 42
- d. 32
- e. 24

2. A dataset $\{x_i\}$ has 10 values. Its variance is 18 and its sum is 12. Find $\sum_{i=1}^8 x_i^2$.

- a. 120
- b. 184.8
- c. 180
- d. 194.4
- e. 160.2

3. The dataset $\{2, 4, 6, x\}$ has a variance of 40 and a mean of 4. Find x .

- a. 32
- b. 4
- c. 40
- d. 10
- e. 42

4. Find the variance of the set of positive integers until n .

- a. $\frac{\sum_{i=1}^n (i + \frac{n+1}{2})^2}{n}$
- b. $\frac{\sum_{i=1}^n (i - n + 1)^2}{n}$
- c. $\frac{\sum_{i=0}^n (i - \frac{n+1}{2})^2}{n}$
- d. $\frac{\sum_{i=1}^n (i - \frac{n}{2})^2}{n}$
- e. $\frac{\sum_{i=1}^n (i - \frac{n+1}{2})^2}{n}$

5. The mean of a dataset is 12 and $\sum_{i=1}^{25} x_i^2 = 3,800$. Find σ^2 .

- a. 16
- b. 24
- c. 4
- d. 96
- e. 8

6. Find the standard deviation of a data set that has 5 elements that sum to 24, if the sum of the squares of the elements is 130.
- 1.72
 - 8.42
 - 1.36
 - 3.8
 - 2.4
7. A set has 28 data points. Its sum of squares differences from the mean is 1,232. Find the standard deviation.
- 7.822
 - 6.633
 - 8.24
 - 4.56
 - 12.62
8. Find the standard deviation of the data set given by $\sum_{n=1}^4 36\left(\frac{1}{3}\right)^n$.
- 5.24
 - 2.84
 - 4.55
 - 8.42
 - 5.44
9. 2σ is CLOSEST in value to
- $\frac{range}{2}$
 - $4\sigma^2$
 - $\frac{IQR}{2}$
 - σ^2
 - $\frac{range}{IQR}$
10. A set of values is such that $\sigma = 4$ and $\sum_{i=1}^{12} x_i^2 = 204$. Find \bar{x} .
- 4
 - 1
 - 1
 - 0
 - 4

MATHEMATICS FOCUSED QUIZ 22 – Z-SCORES

1. 42 has a z-score of 2 in a data set with mean 28. Find the variance.
 - a. 4
 - b. 49
 - c. 8
 - d. 24
 - e. 7

2. A data set has a variance of 9 and a mean of 30. Express the z-score of x .
 - a. $\frac{x}{9} - 10$
 - b. $x - 10$
 - c. $\frac{x}{3} - 10$
 - d. $\frac{x}{3} - 9$
 - e. $\frac{x}{3} - 15$

3. Which element in $\{2, 6, 8, 14, 20\}$ has the highest z-score?
 - a. 14
 - b. 8
 - c. 2
 - d. 20
 - e. 6

4. An element in a set has a z-score of -1.2. If this element is 12 less than the mean, find the variance.
 - a. 100
 - b. 40
 - c. 20
 - d. 18
 - e. 160

5. A dataset has a mean of 20 and a standard deviation of 1.2. The highest and lowest elements of the dataset have z-scores of 3 and -2.5 respectively. Find the range.
 - a. 2.8
 - b. 3.8
 - c. 4.2
 - d. 5.6
 - e. 6.6

6. A dataset with 20 points has a mean \bar{x} and variance σ^2 . Each data point has a z-score of z_n . Express the sum of the elements in the set as a sigma notation.
- $20\bar{x} + \sigma^2 \sum_{n=0}^{20} z_n$
 - $20\bar{x} + \sum_{n=0}^{20} z_n$
 - $20\bar{x}^2 + \sigma \sum_{n=0}^{20} z_n$
 - $\bar{x} + \sigma \sum_{n=0}^{20} z_n$
 - $20\bar{x} + \sigma \sum_{n=0}^{20} z_n$
7. Which of the elements in the dataset {1, 4, 8, 12, 15} has a z-score of 0?
- 15
 - 12
 - 8
 - 4
 - 1
8. Find the total z-scores of the data set {1, 2, 3, 4, 5}
- 3
 - 2
 - 1
 - 0
 - 1
9. Find the variance of a data set if its elements 32 and 21 have z-scores of 0.3 and -0.2 respectively.
- 75.6
 - 45
 - 15
 - 60.5
 - 484
10. Find the mean of a data set where 24 has a z-score of -2 and 38 has a z-score of 1.5.
- 26
 - 28
 - 32
 - 38
 - 42

MATHEMATICS FOCUSED QUIZ 23: REVIEW OF DESCRIPTIVE STATISTICS

1. Find the mean of the series defined by $\sum_{n=1}^9 3 \times 2^n$.
 - a. $64\frac{1}{3}$
 - b. $180\frac{2}{3}$
 - c. 512
 - d. 256
 - e. $511\frac{2}{3}$

2. Which of the following options has the same standard deviation as the set defined by $\sum_{n=1}^{10} 7^n$?
 - a. $\sum_{n=1}^{10} (7^n + 1)$
 - b. $\sum_{n=1}^{11} 7^n$
 - c. $\sum_{n=0}^{10} 7^n$
 - d. $\sum_{n=1}^{10} 14^n$
 - e. $\sum_{n=1}^{10} 7^{2n}$

3. The standard deviation of the data set $\{0, 0, 0, 0, n\}$ is 3. Find n .
 - a. 12
 - b. 7.5
 - c. 5
 - d. 2.5
 - e. 9

4. $\sum_{i=1}^8 x_i^2 = 2,550$; $\bar{x} = 13$. Find σ .
 - a. 9.4
 - b. 4.2
 - c. 8.4
 - d. 6.8
 - e. 12.2

5. The dataset $\{-2, -4, 6, 10, 13, 15, 19, 22, 26\}$ has one element removed. Which element would decrease the variance MOST?
 - a. 26
 - b. -2
 - c. 22
 - d. -4
 - e. 19

6. Find the variance of the data set {2, 18, 3, 5, 4}.
- 31.82
 - 34.64
 - 39.26
 - 46.43
 - 49.28
7. A dataset has $Q1 = 13$, $IQR = 24$, and smallest element 1. Find the range of its possible outliers.
- $(-\infty, 73)$
 - $(-\infty, 5)$ and $(73, \infty)$
 - $(73, \infty)$
 - $(-\infty, 5)$
 - $(-\infty, 5)$ and $(37, \infty)$
8. Find the sum of the mean, median, and mode of the data set {-6, 7, -12, 3, 15, -3, 2, 7}.
- 14.285
 - 5.625
 - 9.725
 - 6.325
 - 11.125
9. Find the mean of a data set with a standard deviation of 4, where x has a z-score of -2 and $2x$ has a z-score of 1.
- 20
 - 25
 - 55
 - 40
 - 30
10. Which of the following datasets has the smallest variance?
- {0, 10, 0, 10, 0, 20, 0, 20}
 - {14, 14, 14, 14, 14, 14, 14, 15}
 - {-5, -3, -1, 1, 3, 5, 7, 9}
 - {30, 28, 26, 24, -24, -26, -28, -30}
 - {1, -1, 3, -3, 5, -5}

MATHEMATICS FOCUSED QUIZ 24: PROBABILITIES OF INDEPENDENT EVENTS

1. The probability that the independent events W , X , Y , and Z all occur is .0125. The probability of both events W and X occurring is .05 and the probability of both events W and Y occurring is .025. Which of the following probabilities is possible?
 - a. $p(X) = .4, p(Y) = .4, p(Z) = .625$
 - b. $p(X) = .8, p(Y) = .4, p(Z) = .625$
 - c. $p(X) = .8, p(Y) = .2, p(Z) = .625$
 - d. $p(X) = .8, p(Y) = .3, p(Z) = .325$
 - e. $p(X) = .8, p(Y) = .4, p(Z) = .25$

2. Travelers have a .2 chance of being 30 minutes late for their flight. Flights have a .45 chance of being delayed 30 minutes. Assuming these two events of being independent, find the probability that a traveler misses their flight.
 - a. .01
 - b. .18
 - c. .09
 - d. .11
 - e. .21

3. There is a .2 chance of this quiz having a typo and a .8 chance that it will be proofread. Assuming these two events are independent and the proofreader does not make mistakes, what is the chance that it will be published with a typo?
 - a. .36
 - b. .04
 - c. .28
 - d. .08
 - e. .12

4. Two fair six-sided dice are rolled. Find the probability that the dice sum to 4.
 - a. $\frac{1}{3}$
 - b. $\frac{1}{4}$
 - c. $\frac{1}{12}$
 - d. $\frac{1}{36}$
 - e. $\frac{1}{216}$

5. A bag contains 4 purple marbles, 3 maroon marbles, and 5 teal marbles. If 1 marble is pulled out at a time and replaced, what is the probability that 4 consecutive teal marbles will be selected?
- a. $\frac{144}{5,184}$
- b. $\frac{625}{5,184}$
- c. $\frac{312.5}{20,736}$
- d. $\frac{625}{10,368}$
- e. $\frac{625}{20,736}$
6. An event must result in A, B, or C outcome. $p(A) = 3p(B)$ and $p(B) - p(C) = .1$. Find $p(B')$.
- a. .78
- b. .24
- c. .92
- d. .96
- e. .2
7. The probability that it remains cold in February is .55. The probability that winter jackets go on sale in January is .25. If Jan only buys winter jackets on sale, what is the probability that she will use a winter jacket in February?
- a. 0.55
- b. 0.1375
- c. 0.25
- d. 0.384
- e. 0.245
8. Candidates X, Y, and Z are being considered for a job. The probability that the company decides to hire an extra person is .025. The probability that candidate X is the last-ranked candidate is .1. Find the probability that X is the ONLY person not hired.
- a. .01
- b. .005
- c. .05
- d. .0025
- e. .001

9. Find $p(A)$ if $p(A)p(B) = 0.24$, and either of $p(A)$ or $p(B)$ must occur.
- a. .1
 - b. .2
 - c. .3
 - d. .5
 - e. .6
10. The probability that A occurs is twice the probability that B occurs. If both events are independent, it MUST be the case that
- a. $p(A) \geq 0.5$
 - b. $p(B) \geq 0.5$
 - c. $p(B') \geq 0.5$
 - d. $0.5 \geq p(A)p(B)$
 - e. $0.75 \geq p(A)p(B)$

MATHEMATICS FOCUSED QUIZ 25: PROBABILITIES OF DEPENDENT EVENTS

1. The probability of a meme going viral and appearing on KnowYourMeme is .2 The probability of a viral meme appearing on KnowYourMeme is .4. Find the probability of meme going viral.
 - a. .16
 - b. .08
 - c. .4
 - d. .2
 - e. .5

2. A dog has a 30% chance of meeting a stranger on its walk and biting it. It has a 45% chance of meeting a stranger on its walk. Find the probability that it will bite a given stranger.
 - a. $\frac{3}{5}$
 - b. $\frac{2}{5}$
 - c. $\frac{1}{3}$
 - d. $\frac{2}{3}$
 - e. $\frac{2}{9}$

3. 3 cards are drawn from a set of 52 cards. Find the probability that they are all from different suits.
 - a. .623
 - b. .413
 - c. .823
 - d. .521
 - e. .235

4. The probability of rolling a 1 on a fair six-sided dice is $\frac{1}{3}$ given that
 - a. the number was not divisible by 3
 - b. the number rolled was less than 3
 - c. 6 was not rolled
 - d. a prime number was rolled
 - e. an odd number was rolled

5. A person has a .3 chance of being vegetarian and a .75 chance of turning vegan if they are vegetarian. What is the probability of a person being vegan?
- a. .1125
 - b. .55
 - c. .45
 - d. .125
 - e. .225
6. Jay has a 0.85 chance of finishing a novel and a 0.2 chance of finishing a romance novel. Find the probability that he is reading a romance given that he finishes it.
- a. .524
 - b. .17
 - c. .235
 - d. .34
 - e. .47
7. A philosophy major has a .8 probability of finding a job and a .45 probability of having a job that pays more than \$3,000 a month. Find the probability that they earn more than \$3,000 a month given that they have a job.
- a. .2585
 - b. .4245
 - c. .6835
 - d. .5625
 - e. .3855
8. A college student has a .6 chance of submitting a paper on time and a .4 chance of submitting a paper on time if they played video games the night before. Find the probability that they submit a paper on time AND played video games the night before.
- a. .2
 - b. .12
 - c. .36
 - d. .4
 - e. .24

9. Google has a .8 chance of predicting your next destination if a person uses its maps service. If a given person has a .95 chance of using its maps service, find the probability that a person uses Google Maps and Google predicts their next destination.
- a. .76
 - b. .72
 - c. .82
 - d. .8
 - e. .7
10. A sandwich maker has a .3 chance of burning the toast. Jan has a .2 chance of eating it anyway. Find the probability that the toast is burned AND Jan eats it.
- a. .1
 - b. .06
 - c. .5
 - d. .6
 - e. .09

MATHEMATICS FOCUSED QUIZ 26: EXPECTED VALUE

- A dice is rolled 4 times. Let n be the number of odd numbers rolled such that the person rolling the dice receives $3n^2 - 2n$. Find the expected payout from the game.
 - 11
 - 1
 - 4
 - 10
 - 13
- Ann plants violets and orchids. There is a 45% chance that the violets will bloom. If the violets bloom, there is a 75% chance the orchids will as well. If the violets do not bloom, there is a 30% chance that the orchids will bloom. Ann typically harvests 30 flowers if both flowers bloom and the 12 flowers if only one type of flower blooms. Find the expected number of flowers she harvests.
 - 16.285
 - 14.825
 - 18.585
 - 13.455
 - 16.735
- Four choices are offered in a game. The correct choice pays out \$15 and the other choices pay nothing. What is the maximum someone should pay to play the game?
 - \$7.25
 - \$3.75
 - \$5.05
 - \$1.85
 - \$2.55
- Find x if the expected value of the distribution in the table below is 9.

Value	2	4	8	12
Probability	.2	.35	.4	x

- 0.34
- 0.12
- $0.\overline{11}$
- 0.25
- $0.\overline{33}$

5. A dice is rolled. If the number is a multiple of 3, the player earns \$6. If the number is 1 or 5, the player pays \$12. If this is a fair game, what happens if a multiple of 2 is rolled?
- pay \$4
 - pay \$2
 - nothing
 - earn \$2
 - earn \$4
6. A 5-question trivia quiz ends as soon as a player has given a wrong . The player earns \$2 for each correct answer and has a constant 0.8 probability of giving a correct . Find the expected value earned from the game.
- 5.38
 - 8.24
 - 6.28
 - 4.82
 - 7.19
7. A basketball shot can be worth either 1 or 3 points. If the expected value of the number of points a shot is worth is 2.09, what is the probability that a random shot is worth 3 points?
- 0.24
 - 0.545
 - 0.7
 - 0.45
 - 0.58
8. The number of questions answered on a test are shown by their probability below. What is the number of questions on the test, if the expected value is 7.5?

Questions	2	3	5	7	All
Probability	0.05	0.1	0.05	0.15	0.65

- 12
- 11
- 10
- 9
- 8

9. The expected value of a distribution based on a random sample is 8. If every data point is doubled in size, the new expected value is
- a. 16
 - b. 32
 - c. 64
 - d. 216
 - e. 432
10. A die is weighted such that there is a .4 probability of rolling a 3 and a .12 probability of rolling any other number. Find the expected value of a given roll of this die.
- a. 2.53
 - b. 3.5
 - c. 4.52
 - d. 3.36
 - e. 3.12

MATHEMATICS

FOCUSED QUIZ 27: VARIANCE AND STANDARD DEVIATION OF PROBABILITY DISTRIBUTIONS

1. A coin is flipped n times. Each head pays \$2 and each tails costs \$2. Find the variance for the resulting probability distribution.
 - a. 6
 - b. 5
 - c. 4
 - d. 3
 - e. 2

2. $\sigma^2 = 30, \bar{x} = 24$. Find $\sum_{i=1}^n [x_i^2 \times p(x_i)]$.
 - a. 915
 - b. 837
 - c. 728
 - d. 606
 - e. 583

3. Find the variance of the probability distribution formed from the roll of a standard six-sided die.
 - a. 2.9
 - b. 3.1
 - c. 3.3
 - d. 3.5
 - e. 3.7

4. There are $x - 1$ tickets with a the number 1 and 1 ticket with the number 0. Find an expression for the variance of the number shown on a randomly drawn ticket.
 - a. $2 - \frac{1-3x}{x^2}$
 - b. $\frac{x+1}{x^2}$
 - c. $2 + \frac{1-3x}{x}$
 - d. $2\left(\frac{1-3x}{x^2}\right)$
 - e. $1 + \frac{1-3x}{x^2}$

5. There is a 20% chance of snow on Monday and a 40% chance of snow on Tuesday. If it snows on either day, the city will send out 15 snow plows. If it snows both days, the city will send out 30 snow plows. Find the variance of the number of snow plows used.

a. 120
b. 60
c. 30
d. 80
e. 90

6. Find the variance of the probability distribution in the following table.

Value	2	5	8	16
Probability	.2	.3	.15	.35

a. 62.54
b. 34.58
c. 18.28
d. 42.89
e. 31.81

7. A lottery has a .1 probability of paying out \$25 and a .2 probability of paying out \$35. The rest of the time, \$0 is paid out. What is the variance of the lottery's probability distribution?

a. 153.65
b. 128.55
c. 217.25
d. 52.85
e. 184.25

8. A box contains 16 white tickets and 12 black tickets. Randomly selecting a white ticket gives a payoff of x while randomly selecting a black ticket has no payout. The variance of the game is approximately 24. Find x .

a. $7\sqrt{3}$
b. $4\sqrt{3}$
c. $12\sqrt{2}$
d. $7\sqrt{2}$
e. $3\sqrt{2}$

9. The probability distribution shown below has a variance of 5.16. Find x .

Value	3	5	7	x	11
Probability	.1	.2	.3	.3	.1

- a. 9
 - b. 11
 - c. 13
 - d. 15
 - e. 17
10. $\sum_{i=1}^n [p(E_i)]E_i^2 = 691$ and the variance is 250. Find the expected value.
- a. 17
 - b. 19
 - c. 21
 - d. 23
 - e. 25

MATHEMATICS FOCUSED QUIZ 28: BINOMIAL DISTRIBUTIONS

1. From a class of 20, there is a probability of .12 that a student will be sick on any day. What is the probability that there will be 3 sick students on a given day?
 - a. .224
 - b. .3
 - c. .36
 - d. .24
 - e. .448

2. Find the variance of the class's number of sick students from above.
 - a. 1.482
 - b. 3.285
 - c. 4.175
 - d. 3.832
 - e. 2.112

3. A binomial distribution has probability p . For which of the following values of p will it have the smallest variance?
 - a. .14
 - b. .24
 - c. .36
 - d. .48
 - e. .54

4. A binomial distribution has a .32 probability of success and an expected outcome of 24 successful trials. Find the total number of trials.
 - a. 60
 - b. 65
 - c. 70
 - d. 75
 - e. 80

5. 25 students sit for the SAT. Each student has a .09 probability of scoring more than 1500. Find the probability that exactly 4 students will score more than 1500.
 - a. .235
 - b. .27
 - c. .115
 - d. .18
 - e. .13

6. Find $\frac{\text{expected value}}{\text{variance}}$ of a binomial distribution with probability .34.
- $1.\overline{12}$
 - $1.\overline{51}$
 - $1.\overline{33}$
 - $1.\overline{27}$
 - $1.\overline{43}$
7. A goalkeeper has a .75 chance of defending any given shot. If 20 shots are taken in the game, what is the probability that no more than 2 goals will be scored?
- 0.90874
 - 0.83701
 - 0.78265
 - 0.88273
 - 0.91863
8. A binomial distribution has x trials and a probability of .25. If the standard deviation is 3, find x .
- 40
 - 44
 - 48
 - 52
 - 56
9. A farmer's market has 20 stalls. A stall has a .6 chance of being open on any given Sunday. Find the probability that exactly 18 stalls will be open on a Sunday.
- 0.01232
 - 0.00075
 - 0.00154
 - 0.00308
 - 0.00616
10. A binomial distribution has variance .9 and expected value 9. What is the probability of the number of successes being 8?
- .19371
 - .27845
 - .32827
 - .23892
 - .14278

MATHEMATICS FOCUSED QUIZ 29: NORMAL DISTRIBUTION

1. A normal distribution has a standard deviation of 18. 99.7% of the data falls between 46 and x . x could be
 - a. -23
 - b. -46
 - c. 82
 - d. 164
 - e. 23

2. A normal distribution has a mean of 12 and a standard deviation of 3. 34% of the data will fall into the interval
 - a. [9, 12]
 - b. [9, 15]
 - c. [6, 15]
 - d. [6, 12]
 - e. [12, 18]

3. A normal distribution has a mean of 24. 81.5% of values fall between 12 and 48. Find the standard deviation.
 - a. 24
 - b. 18
 - c. 16
 - d. 12
 - e. 10

4. In a normal distribution with the mean of 58 and standard deviation of 3, what is the probability of an outcome falling within the interval [52, 76]?
 - a. 92.5%
 - b. 95%
 - c. 84%
 - d. 68%
 - e. 97.35%

5. A normal distribution has a mean of 32 and variance of 4. In which of the following intervals will 13.5% of the data fall?
 - a. [26, 36]
 - b. [28, 32]
 - c. [30, 32]
 - d. [32, 36]
 - e. [34, 36]

6. A normal distribution has a mean of 32 and a standard deviation of 3.5. Find the probability that a data point will be in the interval [25, 39].
- 90%
 - 92.5%
 - 95%
 - 97.5%
 - 98.5%
7. Find the probability of a data point on a normal distribution having a z-score greater than 1.
- .16
 - .32
 - .24
 - .28
 - .36
8. A normal distribution has a standard deviation of 5. If 58 has a z-score of -2, find the mean.
- 68
 - 82
 - 75
 - 85
 - 78
9. 68% of data in a normal distribution lies between [x, y]. Find the sum of the z-scores of [x, y].
- 0
 - 1
 - 2
 - 1
 - 2
10. A normal distribution has a mean of 79. 13.5% of outcomes fall between 94 and 109. Find the standard deviation.
- 13
 - 15
 - 17
 - 19
 - 21

MATHEMATICS FOCUSED QUIZ 30: REVIEW OF PROBABILITY

1. The probability of Dan missing his flight is 0.4 and the probability of him missing his flight and staying overnight in the airport is 0.3. Find the probability of him staying overnight in the airport given that he missed his flight.
 - a. 0.35
 - b. 0.55
 - c. 0.75
 - d. 0.85
 - e. 0.95

2. A vending machine has a 0.3 chance of breaking down and a 0.2 chance of being empty. Assuming these events are independent, what is the probability that you can use the vending machine?
 - a. 0.5
 - b. 0.55
 - c. 0.6
 - d. 0.56
 - e. 0.63

3. Molly's father pays her for mowing the grass. He gives her \$2 65% of the time, \$5 10% of the time, \$8 20% of the time, and \$10 5% of the time. Find her expected wage.
 - a. 8.4
 - b. 3.9
 - c. 7.2
 - d. 2.4
 - e. 5.4

4. Find the variance in her wages.
 - a. 12.62
 - b. 28.53
 - c. 42.81
 - d. 36.27
 - e. 22.59

5. A binomial distribution has a probability of .22. What is the probability that exactly 3 out of 15 trials will be successful?
 - a. .42
 - b. .382
 - c. .44
 - d. .2
 - e. .243

6. A normal distribution has a mean of 44 and standard deviation of 5. Within what interval do 68% of data fall?
- [39, 49]
 - [34, 54]
 - [44, 54]
 - [44, 49]
 - [41.5, 46.5]
7. Julie has a .23 probability of knowing a country's capital and a .7 chance of having been to the country if she does. Find the probability that she knows a country's capital and has visited it.
- 0.14
 - 0.161
 - 0.3
 - 0.322
 - 0.251

8. Find the variance for the probability distribution below.

Value	-6	-3	2	4
Probability	.2	.4	.1	.3

- 11
 - 13
 - 15
 - 17
 - 19
9. Find p in a binomial distribution with 5 trials, if the probability of exactly 4 successful trials is 0.0146.
- .15
 - .18
 - .21
 - .25
 - .32
10. In a normal distribution, 1.35% of the data has a z-score in the range
- [0,2]
 - [1,3]
 - [1,2]
 - [2,4]
 - [2,3]