**Math Practice Test 1**
**"More Practice" Answer Key**

1. **D**

$= 11\frac{5}{21} - 21\frac{4}{51} = -\left(21\frac{4}{51} - 11\frac{5}{21}\right)$
$= -\left(20\frac{55}{51} - 11\frac{5}{21}\right) = -[(20-11) + \left(\frac{55}{51} - \frac{5}{21}\right)]$
$= -\left[9 + \left(\frac{55\cdot 7 - 5\cdot 17}{357}\right)\right] = -[9 + \left(\frac{385-85}{357}\right)]$
$= -\left(9\frac{300}{357}\right) = -9\left(\frac{100}{119}\right) = -9\frac{100}{119}$

2. **D**

0.04 $= \frac{4}{100} = \frac{1}{25} = \frac{10}{250}$

3. **C**

$\frac{3}{125}$ **=** 0.024

0.028 – 0.024 = 0.004 = $\frac{4}{1000} = \frac{1}{250}$

4. **C**

0.52 = $\frac{52}{100} = \frac{26}{50} = \frac{13}{25}$

5. **D**

0.028=$\frac{28}{1000}$=$\frac{7}{250}$

Multiply $\frac{3}{125}$ by 2 = $\frac{6}{250}$

Solve:

$\frac{7}{250} - \frac{6}{250} = \frac{1}{250}$

6. **C**

$0.\overline{84} = \frac{84}{99} = \frac{\cancel{84}^{28}}{\cancel{99}_{33}} = \mathbf{\frac{28}{33}}$

7. **E**

Simplify all the values into decimal form.

a. 0.333
b. 0.600
c. 0.625
d. 0.626
e. 0.667

8. **C**

a. .3
b. 1/.3 = 10/3 = 3.33
c. .3/3 = 0.1
d. **$(.3)^2 = 0.09$**
e. .3 - .003 = 0.297

9. **C**

a. 0.00035
b. $\frac{.355}{100000}$ = 0.00000355
c. $\frac{(35)(10^{-6})}{0.01} = \frac{(35)(10^{-6})}{10^{-2}} = (35)(10^{[-6-2]})$
$= (35)(10^{-4}) =$ **0.0035**
d. 3550$(10^{-8})$ = 0.00003550

10. **C**

(x)$\left(\frac{7}{9}\right) = \frac{2}{3}$
x = $\frac{2/3}{7/9} = \frac{2}{\cancel{3}} \cdot \frac{\cancel{9}^{3}}{7}$
x = $\mathbf{\frac{6}{7} = 85.71\%}$

11. **D**

(-3 x -6) – (-4 + -5) = 18 – (-9) = 18 + 9 = 27

12. **C**

Use " $\frac{\text{is}}{\text{of}}$ " technique.

$\frac{\text{vinegar}}{\text{mixture}} = \frac{2}{2+3} = \frac{2}{5}$

13. **B**

$\text{Indigo} + \text{Aqua} = 8\text{blue} + 2\text{violet} + 2\text{green}$
$\text{Indigo} + \text{Aqua} = 12\text{parts}$
$\text{Blue} = \frac{8}{12} \text{or} \frac{2}{3}$

14. **B**

3 vacant : 2 occupied = 5 seats
36 vacant : **24 occupied** = 60 seats

15. **D**

Let x = number of gummy worms in a pack

Use Ratio and Proportion:

$$\frac{\text{x gummy worms}}{\text{5 mins}} = \frac{\text{28 gummy worms}}{\text{2 mins (from 7 mins} - \text{5 mins)}}$$

$$x = \frac{5 \times \cancel{28}^{14}}{\cancel{2}}$$

$$x = 5 \times 14$$

$$x = 70$$

16. **D**

If growth of sales of Pet Habitat this year is 20%, its sales next year is 1.2 times as this year. So, the sales of an indicated year are 1.2 times as that of its previous year.

Ratio: 1.2 :1 = **6:5**

17. **D**

If there are 98 seniors and 48 of these are girls, then there are 98 – 48 or 50 boys.

Consequently, the ratio of girls to boys among seniors is **48:50**.

18. **C**

$$\frac{\text{P2800}}{\text{3 parts+2 parts+1 part}} = \frac{\text{P2800}}{\text{6 parts}} = \text{P466.67/part}$$

2nd child will get 2 parts:

(2) (P466.67) = **P933.33**

19. **E**

Since it is beyond 75%, it must be 80%.

20. **B**

The 2007 graph is half the 2008 graph, thus, 2:1.

**Math Practice Test 2**
**"More Practice" Answer Key**

1. **A**

$(6)(9)(N) = (-3)^4(-2)^3$

$N = \frac{(-3)^4(-2)^3}{(6)(9)} = \frac{(81)(-8)}{(6)(9)} = \frac{(9)(-8)}{6^2} = \frac{(3)(-8)}{2}$

$N = (3)(-4) = \mathbf{-12}$

2. **B**

$16\frac{2}{3}\%$ of N is 35

$16\frac{2}{3}\% = \frac{50}{3}\%$

$\frac{50}{3} \text{ x } N = 35$

$\frac{3}{50}\left[\frac{50}{3} \text{ x } N = 35\right]\frac{3}{50}$

$N = \frac{21}{10}$

What percent of N is 63?

A% x N = 63

$A \text{ x } \frac{21}{10} = 63$

$\frac{10}{21}\left[A \text{ x } \frac{21}{10} = 63\right]\frac{10}{21}$

A = **30%**

3. **B**

$\frac{(2^{13})(3^{14})}{(27)(6^{12})} = \frac{(2^{13})(3^{14})}{(3^3)(3^{12})(2^{12})} = \frac{(2^{13})(3^{14})}{(3^{15})(2^{12})} = \frac{(2^{13})(3^{14})}{(3^{15})(2^{12})} = \frac{(2)(2^{12})(3^{14})}{(3^{15})(2^{12})} = \frac{(2)(3^{14})}{3^{15}} = \frac{(2)(3^{14})}{(3)(3^{14})} = \mathbf{\frac{2}{3}}$

4. **E**

Evaluate choices.

a. $|7| = 7$

b. $|-7| = 7$

c. $1 - |7| = 1 - 7 = -6$

d. $|7 - 1| = 6$

e. $|-7| + 1 = 7 + 1 = 8$

5. **C**

rate: 50 envelopes/minute

time: $\frac{\text{number of envelopes}}{\text{rate}}$

**n/50**

6. **B**

rate: 7 tables/day

time: $\frac{\text{number of tables}}{\text{rate}}$

**t/7**

7. **B**

$\frac{3}{5}$ x = 15 mins;

$x = \frac{15 \text{ mins.}}{3/5} = (15 \text{ mins.})\left(\frac{5}{3}\right) = \mathbf{25 \text{ mins.}}$

8. A

**w**: $\frac{5}{6}$ finished $\rightarrow \frac{1}{6}$ left

**x**: $\frac{7}{9}$ finished $\rightarrow \frac{2}{9}$ left

**y**: $\frac{13}{18}$ finished $\rightarrow \frac{5}{18}$ left

**z**: $\frac{7}{12}$ finished $\rightarrow \frac{5}{12}$ left

$\frac{1}{6} > \frac{2}{9} > \frac{5}{18} > \frac{5}{12}$; **w, x, y, z**

9. **A**

In 3 hours, there are 180 minutes (3 x 60 = 180). Therefore, in 3 three hours, there are 180 x 2 = 360 people who arrived. 365-360 = 5 people initially in a party.

10. **C**

Ratio and Proportion

$\frac{\text{xfile}}{1\text{min}} = \frac{1\text{file}}{1\frac{3}{4}}$

$x = \frac{1}{\frac{7}{4}} = \frac{4}{7}$

11. **D**

3:5 :: x:35;

5x = (35)(3) = 105

$x = \frac{105}{5} = \mathbf{21}$

12. **B**
Let x be the number of girls
x + 2 be the number of boys

15 = x + (x + 2) + 5 = 2x + 7
8 = 2x
x = 4

There are **4 girls**.

13. **C**
Let x be the price of spaghetti.
y be the price of juice

x + y = 230
x = y + 100
y + 100 + y = 2y + 100 = 230
2y = 130
y = **65**

14. **B**
$(-\sqrt[3]{9^2})^6 = [(-1)(\sqrt[3]{9^2})]^6 = (-1)^6(\sqrt[3]{9^2})^6$
$= (1)(9^{\frac{2}{3}})^6 = 9^{\frac{12}{3}} = 9^4 =$ **6561**

15. **D**
(30m)(20m) = 600 $m^2$
(600 $m^2$) $\left(\frac{P720}{50\ m^2}\right)$ = **P8640**

16. **C**
**Jake**: $\frac{3}{8} \rightarrow \frac{5}{8}$ left
**Sheila**: $\left(\frac{1}{3}\right)\left(\frac{5}{8}\right) = \frac{5}{24}$
$\frac{5}{8} - \frac{5}{24} = \frac{5}{12}$ left
**Henry**: $\left(\frac{1}{2}\right)\left(\frac{5}{12}\right) = \frac{5}{24}$
**$\frac{5}{24}$ left**

**Note:** Since Marian gave half or the remaining pie to Henry, she was left with the other half of the remaining pie. Thus, Marian has the same amount of pie as Henry does.

17. **B**
15mm – 6mm = 9mm removed
$\frac{9\ mm}{0.006\ mm/sheet}$ = **1500 sheets**

18. **D**
(30m)(20m) = 600 $m^2$
(600 $m^2$) $\left(\frac{P720}{50\ m^2}\right)$ = **P8640**

19. **A**

| | Number | Amount(pesos) |
|---|---|---|
| 25 centavos | x | .25x |
| one peso | 2x | 2x |
| five peso | 2x-9 | 10x - 45 |
| TOTAL | | 12.5x - 45 |

12.5x – 45 = 28.5
12.5x = 73.5
x = 6
Number of five-peso = 2 (6) – 9 =**3**

20. **A**
Cars = ½ (1000000) = 500000
Bus = ¼ (1000000) = 250000
Car + Bus = 750000 = **$7.5 \times 10^5$**

**Math Practice Test 3**
**"More Practice" Answer Key**

1. **C**

Evaluate

$$\frac{2^{-2}-2^{-3}}{2^{-2}} =$$

$$= \frac{\frac{1}{4}-\frac{1}{8}}{\frac{1}{4}}$$

$$= \frac{4}{8} \text{ or } \frac{1}{2}$$

2. **A**

2:25 pm = 14:25 (military time)
10:00 to 14:25 = 4 hrs and 25 mins
8:00 – 7:00 = 1 hour time difference
4 hrs. & 25 min. – 1 hr = **3 hrs. & 25 mins.**

3. **B**

$$\frac{\left(\frac{5}{6}\right)^3}{\frac{25}{6^2}} = \frac{\frac{5^3}{6^3}}{\frac{5^2}{6^2}} = \left(\frac{5^3}{6^3}\right)\left(\frac{6^2}{5^2}\right) = \left(\frac{\cancel{5^3}}{6^3}\right)\left(\frac{6^2}{\cancel{5^2}}\right)$$

$$= \left(\frac{5}{6^3}\right)\left(\frac{6^2}{1}\right) = \frac{5}{6}$$

4. **A**

$$\frac{5}{8} \text{ of } \frac{32}{115} \text{ of } \frac{161}{200} = \left(\frac{5}{8}\right)\left(\frac{32}{115}\right)\left(\frac{161}{200}\right)$$

$$= \left(\frac{5}{\cancel{8}}\right)\left(\frac{\cancel{32}}{115}\right)\left(\frac{161}{200}\right) = \left(\frac{5}{1}\right)\left(\frac{4}{115}\right)\left(\frac{161}{200}\right)$$

$$= \left(\frac{1}{1}\right)\left(\frac{4}{\cancel{23}}\right)\left(\frac{\cancel{161}}{200}\right) = \left(\frac{1}{1}\right)\left(\frac{4}{1}\right)\left(\frac{7}{200}\right)$$

$$= \frac{7}{50}$$

5. **D**

Take note that the given numbers are the first 100 odd numbers, it means that it is all odd numbers from 1 – 199 and these numbers form an arithmetic sequence. Thus, applying the formula:

$$\text{sum} = \left(\frac{1\text{st} + \text{last}}{2}\right)\text{n}$$

$$\text{sum} = \left(\frac{1+199}{2}\right)100$$

$$\text{sum} = \left(\frac{1+199}{2}\right)100$$

$$\text{sum} = (100)100$$

$$\text{sum} = 10{,}000$$

6. **C**

Sum of terms in a sequence
=(Average)(# of terms)

$$\text{Average} = \frac{1\text{st term} + \text{last term}}{2}$$

$$= \frac{21+72}{2} = 46.5$$

Number of terms

$$= \frac{\text{last term} - \text{1st term}}{\text{common difference}} + 1$$

$$= \frac{72-21}{3} + 1 = \frac{51}{3} + 1 = 18$$

Sum = (46.5)(18) = **837**

7. **A**

Sum = (Average)(Number of terms);
Since the arithmetic mean is synonymous to average, we can change the equation above to

Sum = (Arithmetic Mean)(Number of terms)
Sum = (12)(10)
Sum =120

After one of the ten numbers is removed, the average of the remaining numbers goes up to 13. Thus the sum of the remaining 9 numbers is

Sum = (13)(9)
Sum = 117

Thus, the number the difference between the sum of the ten numbers and the sum of the nine numbers is 120 – 117 = **3**.

8. **C**

Let x be the price of refrigerator
(5%)(x) = (0.05)(x) = P500.00
x = $\frac{P500}{0.05}$ = **P10 000**

9. **C**

Total cost of taxed goods
=P540 + (P540) (12%)
=P540 + (P540) (0.12)
=(P540) (1.12)
=P604.80

Total cost of all goods
= taxed goods + untaxed goods
= P604.80 + P66
= **P670.80**

10. **D**
Given only the cost of a compact disc player, you cannot determine the percent discount placed on it.

11. **E**
Let P = original price = 100%
(80%) P = 600
P = 750

12. **C**
$495 = \ 100\%P + 10\%P$
$495 = P + \frac{10}{100}P$
$495 = \frac{100}{100}P + \frac{10}{100}P$
$495 = \frac{110}{100}P$

$\frac{10}{11}\left[495 = \frac{11}{10}P\right]\frac{10}{11}$
Get the 10% of 450
450 x 0.10 = 45
450 – 45 = 405

The salesman should have sold the book at **₱405.00.**

13. **D**
Time = $\frac{\text{distance}}{\text{speed}} = \frac{5\text{ km}}{25\text{ km/h}} = 0.2$ hr
$(0.2\text{ hr})\left(\frac{60\text{ minutes}}{\text{hour}}\right) = 12$ mins.
He will arrive 12 minutes past 9:00 or at **9:12 a.m.**

14. **C**
A∩B = X
(A∩B)∩X = X∩X = **X**

15. **C**
(A∪B) = set of all numbers which are contained in either A or B = $\left\{\frac{1}{2}, \frac{1}{4}, \frac{3}{2}, \frac{3}{4}\right\}$

(A∪B)∪C = set of all numbers which are contained in either the union of A or B

$\left(\left\{\frac{1}{2}, \frac{1}{4}, \frac{3}{2}, \frac{3}{4}\right\}\right)$ or in C $\left(\left\{\frac{1}{6}, \frac{1}{3}, \frac{1}{2}\right\}\right) = \left\{\frac{1}{2}, \frac{1}{4}, \frac{3}{2}, \frac{3}{4}, \frac{1}{6}, \frac{1}{3}\right\}$

X = A∩B = set of all numbers which are contained in both A and B = $\left\{\frac{1}{2}, \frac{1}{4}\right\}$

**Math Practice Test 4**
**"More Practice" Answer Key**

1. **D**
15, 15, 16, 16, 17, 17,18, 18, 18, 19, 19
**18** occurs 3 times.

2. **C**
**Permutation.** $\frac{n(n-1)}{2} = \frac{6(5)}{2} = 15$

3. **C**
Sum = (Average)(number of items)
Sum of weights = (57g)(3) = 171g

Since balls A and B are identical and the weight of ball A is 46g, then the weight of ball B is also 46g. Thus, the weight of ball C is 171g – [(46g)(2)] = 171 g – 92 g = **79 g**.

4. **B**
3 soft drinks + 2 juices = 5 drinks
# of combinations = 2 sandwiches · 5 drinks
= **10 combinations**

5. **B**
If three pairs of pants could be partnered to five shirts, then the number of shirt-pants combinations from those are (3)(5) or 15 combinations.

If two pairs of pants could be partnered to four shirts, then the number of shirt-pants combinations from those are (2)(4) or 8 combinations.

Since all the shirt-pants combinations can be paired with any of the two blazers, then the number of possible 3-piece attires is (15+8)(2) = (23)(2) = **46**.

6. **B**
Let x be the # of tables w/ 4 chairs
20 – x be the # of tables w/ 6 chairs

(4)(x) + (6)(20 - x) = 92
4x + 120 – 6x = 92
-2x = -28
x = **14**

7. **E**
Let x be the number of tables with 4 chairs and y be the number of tables with 6 chairs.

x + y = 20

multiply by -6:
4x + 6y = 92

eliminate y:
-6x -6y = -120
4x + 6y = 92
-2x = -28
**x =14**

8. **D**
Probability = $\frac{\text{numberofdesiredoutcomes}}{\text{totalnumberofoutcomes}}$
$= \frac{\text{5 greenmarbles}}{\text{5 greenmarbles+2 bluemarbles+3 redmarbles}}$
$= \frac{5}{10} = \frac{1}{2} = 50\%$

9. **D**
Probability= $\frac{number\ of\ desired\ outcomes}{total\ number\ of\ possible\ outcomes}$

Desired outcome:
Sum shown on dice is divisible by 5.
(1 + 4; 4 + 1; 2 + 3; 3 + 2; 6 + 4; 4 + 6; and 5 + 5):
**seven favorable outcomes**

Possible outcomes:
(6)(6) = 36 :
(Six possible outcomes on each die.)

10. **C**
Probability of getting blue balls: $\frac{6}{6+n} = \frac{2}{5}$

Cross multiply:
30=2(6+n)
30=12 + 2n
18=2n
9=n

11. **C**

Ave. speed = $\frac{\text{total distance}}{\text{total time}} = \frac{120 \cdot 2 \text{ km}}{2+3 \text{ hrs}}$

$= \frac{240\ km}{5\ hrs} = 48$ km/hr = **48 kph**

12. **D**

Ave. speed = $\frac{\text{total distance}}{\text{total time}} = \frac{30 \text{ km}}{\frac{20 \text{ km}}{10 \text{ kph}} + \frac{10 \text{ km}}{5 \text{ kph}}}$

Average speed$= \frac{30 \text{ km}}{4} = 7.5\ kph$

**Math Practice Test 5**
**"More Practice" Answer Key**

1. A

Get the LCM of 9 and 21 mins. The LCM is 63. Thus, they will ring together again after 63 mins which is 1:03 pm.

2. **C**

Let A be the set of students playing basketball
B be the set of students playing badminton

Assuming that the whole class plays either basketball or badminton or both, then A∪B is the set of all students = 30.

A+B - A∪B = A∩B
20 + 23 – 30 = A∩B = **13**

3. **C**

This is a permutation problem since we are talking about arrangements, thus order is important. Since there is a restriction, we need to be cautious in answering.

We will make A & B as one entity since they are must be beside each other, same as D & E, resulting to a scenario that arranges 3 objects only. The formula for that is

3 x 2 x 1 = 6

But we need to take account that the merged A & B can change places so we will multiply the previous answer to 2!. And since D & E were considered to be one as well, we will multiply the new answer by 2! again.

Final solution is given by (3 x 2 x 1) x 2! x 2! = 6 x 2 x 2 = **24**.

4. **C**

simple interest: I = Prt

1st year: $I_1 = 1000\left(\frac{10}{100}\right)(1) = 100$

2nd year: $I_2 = 2000\left(\frac{10}{100}\right)(1) = 200$

After 2 years: Total money = P + $I_1$ + $I_2$
Total money = 2000 + 100 + 200 = **2300**

5. **D**

This is a permutation problem since order is important.

$${}_8P_3 = \frac{8!}{(8-3)!} = \frac{8!}{5!} = \frac{8x7x6x5!}{5!} = 8x7x6$$
$$= \mathbf{336}$$

6. **C**

Ratio = Filipino:Foreigners
3:2 = **6**:4

$$6 = \frac{1}{4}\text{class}$$
$$\text{class} = 24$$
$$\text{Boys} = \text{Class} - \text{Filipino} - \text{Foreigners}$$

Boys = 24 – 6 – 4 = **14**

7. **E**

Every second, M covers 5.5m while J covers 4.5m. That's a total of 10m. Therefore, it will take 2 seconds for them to cover a total distance of 20m. At that time, M will have covered **11 m.**

8. **B**

Distance(D) = Speed(s) x Time(t)
D $_{Train\ A}$ = (30kph)(t)= 30t
D $_{Train\ B}$ = (40kph)(t-2) = 40t - 80

NOTE: time for Train B is less two hours since it will leave 2 hours earlier than Train A

Distance $_{Train\ A}$ +Distance $_{Train\ B}$ = 200 km
30t + 40t - 80 = 200
70t - 80 = 200
t = 4

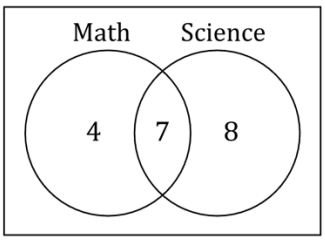
Train A : 8A.M. + 4h = **12 P.M.**

9. **C**

Let M be a male person
Let >20 be a person having an age greater than 20

$$P(M \cup > 20) = P(M) + P(> 20) - P(M \cap > 20)$$
$$= \frac{3}{4} + \frac{3}{4} - \frac{3}{4} = \mathbf{\frac{3}{4}}$$

10. **B**




Students who like both math and science= 7
Students who like only math= 11-7 = 4
Students who like only science= 15-7= 8
Total = 4+8+7 = 19

Thus, 31 students like neither math nor science.

11. **A**

People who drink at most 3:
= 30 + 45 + 38 + 13 = 126

People who drink at most 1:
=30 + 45 = 75

126-75= 51 people

Thus, there are 51 more people who drink at most three bottles more than people who drink at most one bottle per day.

12. **C**

**Math Practice Test 6**
**"More Practice" Answer Key**

1. **D**
(in getting the first digit, we can choose from 3,4, or 5 to have a digit greater than 300)
Repeating: $3 \times 5 \times 5 = 75$
Order is important: 75

2. **B**
Let A be the set of players in the 1st game
B be the set of players in the 2nd game
Assuming that all the players will play at least one game, then A∪B = 12.
A+B - A∪B = A∩B
8 + 7 – 12 = A∩B = **3**

3. **B**
matches for semifinals = ?
participating teams (n) = 16
number of selection for semifinals (r) = 4

Use the Combination Formula:
$16C4 = \frac{16!}{4!(16-4)!}$
$16C4 = \frac{16!}{4!(12)!}$
$16C4 = \frac{16 \times 15 \times 14 \times 13}{4 \times 3 \times 2 \times 1}$
$16C4 = \mathbf{1820}$

4. **C**
There are 9 ways to get the captain.
$9C1 = \frac{9!}{1!(8)!}$
$9C1 = \mathbf{9}$

Choose the remaining 6 players from the remaining 8 players using the combination formula.
$8C6 = \frac{8!}{6!(2)!}$

$8C6 = \frac{8 \text{ x } 7}{2}$

$8C6 = \mathbf{28}$

28 x 9= 252 ways

5. **B**
$$P(\text{twins}_{\text{GIRLS}}) = 0.42$$
$$P(\text{twins}_{\text{BOYS}}) = 0.30$$

The three possible cases are:
- The twins are two boys.
- The twins are two girls.
- The twins are one girl and one boy.

The probability of having twins is 1.
$$P(\text{twins}) = 1$$

To get the probability that there are one boy and one girl :
$P(\text{twins}_{\text{Either B Or G}}) = P(\text{twins}) - P(\text{twins}_{\text{G}}) - P(\text{twins}_{\text{B}})$
$P(\text{twins}_{\text{EitherBoyOrGirl}}) = 1 - 0.42 - 0.30 = 0.28$

The probability that there are one boy and one girl is **0.28.**

6. **B**
56, 74, 66, 59, 59, 65, 63, 63, 71, 64

arrange from least to greatest:
56, 59, 59, 63, 63, 64, 65, 66, 71, 74

To get average, add all numbers then divide by 10:
56+59+59+63+63+64+65+66+71+74=640
$$\boldsymbol{average} = \frac{640}{10} = \mathbf{64}$$

To find the median of 10 values (an even number), divide 10 by 2, then add 1 to get the two middle positions.
Median= $\frac{640}{10}$= 5th  5 + 1= 6th

Get the values at the 5th and 6th positions, then find their average.
**Median** = $\frac{63+64}{2}$= $\frac{127}{2}$= **63.5**

$$average - median = 64 - 63.5$$
$$\boldsymbol{average - median} = \mathbf{0.5}$$

7. **B**
0.6 (4) = 0.2 + 0.8 + 1.0 + x
2.4 = 2.0 + x
x = 0.4

8. **C**

Let A be the group of Ilonggo-speaking students
B be the group of Visayan-speaking students

Since there are 3 students who speak neither Ilonggo nor Visayan, then the total number of students who can speak at least one language is $A \cup B = 15 - 3 = 12$.

$A + B - A \cup B = A \cap B$

$8 + 7 - 12 = A \cap B$

$15 - 12 = 3 = A \cap B$ (number of students who knows both dialects)

$$\text{Probability} = \frac{\text{students who knows both dialects}}{\text{total number of students}} = \frac{3}{15} = \mathbf{\frac{1}{5}}$$

9. **B**

Working backwards: 5 x 20 = 100. The sum of the 5 integers is 100. 3 x 8 = 24. The sum of the middle 3 integers is 24. Thus, the sum of the first and last integer is 100 – 24 = 76. Their average is 76/2 = **38**.

10. **A**

$$P(\text{GIRL}) = \frac{9}{20}$$

Let x be the number of girls

$$\frac{9}{20} = \frac{x}{120}$$

$$\frac{1080}{20} = \frac{20x}{20}$$

$$54 = x$$

There are 54 girls.

Let N be the number of students from NAGA
Let M be the number of students from MAYON

$$\frac{1}{3}N + \frac{1}{2}M = 54$$

$$N + M = 120$$

$$M = 120 - N$$

$$6\left[\frac{1}{3}N + \frac{1}{2}(120 - N) = 54\right]6$$

$$2N + 3(120 - N) = 324$$

$$2N + 360 - 3N = 324$$

$$-N = 324 - 360$$

$$-N = -36$$

$$N = 36$$

To get the probability that a student from NAGA will be randomly chosen:

$$P(\text{NAGA}) = \frac{N}{120} = \frac{36}{120} = \frac{3}{10} = \mathbf{0.3}$$

The probability that a student from NAGA will be randomly chosen is 0.3.

**Math Practice Test 7**
**"More Practice" Answer Key**

1. **B**

$\frac{2}{3}\bullet\frac{3}{4}\bullet\frac{4}{5}\bullet\frac{5}{6}=\frac{2}{6}\text{or}\frac{1}{3}$

2. **C**

32, 24, 48, 40, 64, 56, ?

+16 +16 +16

64 + 16 = 80

3. **B**

In a sequence, the $n^{th}$ term can be computed as
$a_n = a_1 + d(n-1)$

The $9^{th}$ term, $a_9 = a_1 + 8d = 9$
The $15^{th}$ term, $a_{15} = a_1 + 14d = 30$.

Treating the two equations as a system of equations with $a_1$ and d as the variables,
$a_1 + 8d = 9$

(multiply by -1)
$a_1 + 14d = 30$
$-a_1 - 8d = -9$
$a_1 + 14d = 30$

(eliminating $a_1$,)
$6d = 21$
$d = 3.5$

(Using $a_9$ to get $a_1$,)
$9 = a_1 + 8(3.5)$
$a_1 = 9 - 28$
**$a_1 = -19$**

4. C

$A_2$ = ?
$A_4$ = 21 change to $A_1$ = 21
$A_{10}$ = 9 change to $A_7$ = 9

$A_n = A_1 + (n-1)\,d$
$A_7 = A_1 + (7-1)\,d$
$9 = 21 + 6d$
$9 - 21 = 6d$
$\frac{-12}{6} = \frac{6d}{6}$
$-2 = d$

$A_4 = 21$
$A_3 = 21 - (d) = ?$
$A_3 = 21 - (-2) = 23$
$A_2 = 23 - (d) = ?$
$A_2 = 23 - (-2) = 25$
**$A_2 = 25$**

5. No answer

Let us just use the formula of an arithmetic sequence.

$A_n = A_1 + (n-1)d$
$A_n = 2 + (7-1)\,(\frac{1}{2})$
$A_n = 2 + (6)\,(\frac{1}{2})$
$A_n =$ **5**

6. **C**

In an arithmetic sequence, the $8^{th}$ term =[$1^{st}$ term + (7)(common difference)] and the $15^{th}$ term = [$1^{st}$ term + (14)(common difference)].
Let $A_1$ be the $1^{st}$ term
d be the common difference

$A_1 + 14d = 30$
$-$ $A_1 + 7d = 9$
$7d = 21$
$d = 3$
$A_1 + 14d = 30$
$A_1 = 30 - 14d$
$A_1 = 30 - (14)(3) = 30 - 42 =$ **$-12$**

7. **C**

Evaluate, use formulas for Arithmetic Sequence

a. n = -12 (we cannot have a negative number of terms)

b. n = 9

$a_9 = 2+(9-1)3 = 26$

$\text{Sum} = \frac{(2+26)}{2}(9) = 126$

Sum = 155 ≠ 126

c. **n = 10**

$a_{10} = 2+(10-1)3 \neq 29$

$\text{Sum} = \frac{(2+29)}{2}(10) = 155$

$\text{Sum} = 155 = 155$

8. **C**

$= \frac{(n)\{-9+[-9+(n-1)3]\}}{2}$

$= \frac{(n)[-9+(-9+3n-3)]}{2}$

$= \frac{(n)[-9+(3n-12)]}{2}$

$= \frac{(n)(-9+3n-12)}{2}$

$= \frac{(n)(3n-21)}{2}$

$= \frac{3n^2-21n}{2} = 66$

$132 = 3n^2 - 21n$

$3n^2 - 21n - 132 = 0$

$n^2 - 7n - 44 = 0$

$(n-11)(n+4) = 0$

$\boldsymbol{n = 11, -4}$

However, since the number of terms cannot be negative (there is no such thing as -4 terms in a sequence), then the number of terms in the sequence must be 11.

9. **E**

Fibonacci Sequence

Start with 1 and 1.

3rd number = 1st + 2nd =1+1 = 2

4th number = 2nd + 3rd =1+2 = 3

5th number = 3rd + 4th = 2+3 = 5

8th number = 6th + 7th = 8+13 = **21**

10. **E**

The common difference is:

7/12. 4/3 – ¾ = 16/12

– 9/12 = 7/12 ¾ - 1/6 =

9/12 – 2/12 = 7/12

Thus, 1/6 – 7/12 = 2/12 – 7/12 = **-5/12**

11. **C**

$\overbrace{\frac{3}{8}, \frac{12}{2}, \frac{4}{6}, \frac{13}{0}, \frac{5}{x}}^{2 \quad 2 \quad 2}$

$6 - 2 = \mathbf{4}$

12. **C**

$a_n = a_1 r^{(n-1)}$

$a_9 = \sqrt{3}\left(\sqrt{2}\right)^8$

$a_9 = 16\sqrt{3}$

13. **C**

Use formulas for Geometric Sequence.

$a_4 = 24 = a_1 r^{(4-1)}$

$a_7 = 192 = a_1 r^{(7-1)}$

Since $a_1 = a_1$, then

$\frac{24}{r^3} = \frac{192}{r^6}$

$r = 2$

$a_1 = \frac{24}{2^3} = 3$

14. **B**

4x, 6y, ___

common ratio: $\frac{6y}{4x} = \frac{3y}{2x}$

next term: ~~6~~y $(\frac{3y}{2x}) = \boldsymbol{\frac{9y^2}{x}}$

15. **D**

At 6:15:

Train A:

(6:15 – 5:00)(10kph) = 12.5 km from station

Train B:

(6:15 – 5:30)(8kph)= 6 km from station

Distance: 12.5km – 6km = 6.5 km = $\boldsymbol{\frac{13}{2}}\,km$