1. [Algebra, 3 Points]

There are 48 students in my class. $\frac{1}{6}$ of the students watched a play on Tuesday and $\frac{2}{6}$ watched it on Wednesday. If half of the remaining students watched the same play on Thursday, then how many students in this class **did not** watch the play?

A) 12 B) 14 C) 16 D) 18 E) 24

2. [Number Theory, 3 Points]

A is the greatest and B is the smallest 4-digit numbers with the following features.

- Both A and B are odd numbers.
- The sum of the digits for both A and B is 8.
- Each digit of A is different.
- Each digit of B is different.

What is the value of the sum A + B?

A) 6226 B) 6236 C) 6244 D) 6468 E) 6548

3. [Combinatorics, 3 Points]

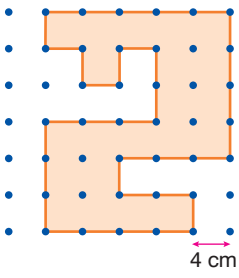
Six students ran a race.
How many ways can they finish 1st, 2nd, and 3rd place?



A) 30 B) 60 C) 75 D) 90 E) 120

4. [Geometry, 3 Points]

The points in the dotted grid on the right are 4 cm apart.
What is the perimeter of the colored shape?



A) 120 cm B) 124 cm C) 128 cm D) 132 cm E) 136 cm

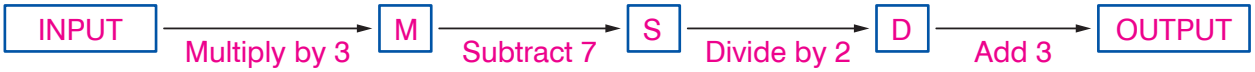
5. [Number Theory, 5 Points]

Joe opens his science book and multiplies the page numbers facing him.
What is the sum of these two-page numbers if their product is 420?
[Note: All pages are numbered consecutively.]

A) 37 B) 39 C) 41 D) 43 E) 45

6. [Algebra, 5 Points]

Consider the following chart:



If the output is 40, what is the input value?

A) 27 B) 29 C) 31 D) 33 E) 35

7. [Geometry, 5 Points]

How many degrees are there in the angle between the hour and minute hands of a clock when the time is 3:30 pm?



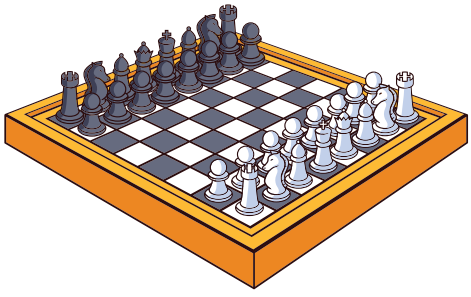
A) 45° B) 60° C) 70° D) 75° E) 90°

8. [Combinatorics, 5 Points]

Seven teams sign up to join in a chess tournament of five teams only.

Two teams must withdraw from the tournament.

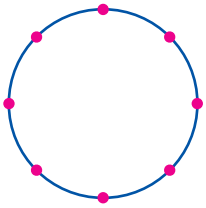
In how many ways can these two teams be chosen out of seven?



A) 14 B) 21 C) 28 D) 35 E) 42

9. [Combinatorics, 7 Points]

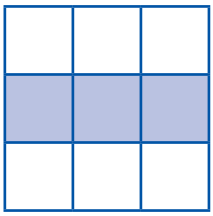
There are 8 points on the circle.
How many different triangles can be drawn using any three of these points as vertices?



A) 28 B) 42 C) 56 D) 84 E) 112

10. [Number Theory, 7 Points]

The figure is a magic square filled with numbers from 1 through 9, one per square. The sum of the integers in each row, column and diagonal is equal.
What is the least possible product of the numbers across the shaded row?



A) 45 B) 72 C) 84 D) 96 E) 105