

[You may use your textbook, course notes, and any homework problems that you have answered personally.] Show all of your work clearly in the space provided or on the additional page at the end of the exam. If the additional page is used, clearly identify to which exam question it is related. Be sure to **read each problem carefully**. You should answer all 6 questions.

1. (10 points) Write the following mathematical expression in C++.

$$\frac{6 + 18}{2}$$

2. (15 points) Determine appropriate data types for the following data:

- the average of four grades
- the number of days in a month
- the length of the Golden Gate Bridge
- the names in a mailing list

3. (20 points) Assume that `amount` has the integer value 3, `m` has the integer value 50, and `x` has the floating point value 6.33. Use the mathematical rules in C++ to evaluate the following expressions:

`m / amount + 2;`

`m / 3 + 6 - 10 * amount;`

`-m / x;`

`52 % m;`

4. (20 points) Identify the errors (if any) in the following lines of code:

```
cout << "\n_<<" 15)
```

```
cout << "setw(4)" << 33;
```

```
int i; 6 + 3 = i;
```

```
cout << set(10) <.768 << setprecision(2);
```



5. (15 points) Write a C++ program that displays your name on one line, your street address on a second line, and your city, state, and zipcode on a third line.



6. (20 points) The value of π can be approximated by the series

$$4\left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \cdots\right)$$

Using this formula, write a program that calculates and displays the value of π using the first four terms of the series.



Additional work area for any problem. Clearly identify to which problem the work on this page is related.