Video Lesson Worksheet: Expressions and Statements

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1. Assume a string object has been defined as follows: string description;

   A. Write a cin statement that reads in a one word description.

   cin >> description;

   B) Write a statement that reads in a description that can contain multiple words separated by blanks.

   getline(cin, description);

2. Write a definition statement for a character array large enough to hold any of the following strings:

   "Billy Bob's Pizza"
   "Downtown Auto Supplies"
   "Betty Smith School of Architecture"
   "ABC Cabinet Company"

char businessName[35];

3. Assume the array name is defined as follows: char name[25];

   A) Using a stream manipulator, write a cin statement that will read a string into name, but will read no more characters than name can hold.

   cin >> setw(25) >>name;

   B) Using the getline function, write a cin statement that will read a string into name but that will read no more characters than name can hold.

   cin.getline(name.25);

4. Assume the following variables are defined:
   int age;
   double pay;
   char section;
   Write a single cin statement that will read input into each of these variables

cin >> age >> pay >> section;

5. What header files must be included in the following program?

```
int main() {
    double amount = 89.7;
    cout << fixed << showpoint << setprecision(1);
    cout << setw(8) << amount << endl;
    return 0;
}
```

```
#include <iostream>
#include <iomanip>
```

6. Write a definition statement for a character array named city. It should be large enough to hold a string 30 characters in length.

```
char city [31];
```

7. Assume the following preprocessor directive appears in a program: #define SIZE 12
How will the preprocessor rewrite the following lines?

A) price = SIZE * unitCost; price = 12 * unitCost;
B) cout << setw(SIZE) << 98.7; cout << setw(12) << 98.7;
C) cout << SIZE; 12;

8. Complete the following table by writing the value of each expression in the Value column

Expression	Value
28 / 4 - 2	5
6 + 12 * 2 - 8	22
4 + 8 * 2	20
6 + 17 % 3 - 2	6
2 + 22 * (9 - 7)	46
(8 + 7) * 2	30
(16 + 7) % 2 - 1	0
12 / (10 - 6)	3
(19 - 3) * (2 + 2) / 4	60

9. Write C++ expressions for the following algebraic expressions:

A) $a = 12x$	a = 12*x;
B) $z = 5x + 14y + 6k$	z = (5*x) + (14*y) + (6*k);
C) $y = x^4$	y = x*x*x*x;
D) $g = \frac{h + 12}{4k}$	g = (h +12) / (4*k);
E) $c = \frac{a^3}{b^2k^4}$	c = (a*a*a) / (b*b*k*k*k*k);

10. Assume a program has the following variable definitions

```
int a, b = 2;
double c = 4.3;
```

and the following statement:

```
a = b * c;
```

What value will be stored in a?

8

11. Assume that qty and salesReps are both integers. Use a type cast expression to rewrite the following statement so it will no longer perform integer division.

```
unitsEach = qty / salesReps;
```

```
unitsEach = static_cast<double>(qty) / salesReps;
```

12. Rewrite the following variable definition so the variable is a named constant with the value 12.

```
int rate;
```

```
const int RATE = 12;
```

13. Complete the following table by writing statements with combined assignment operators in the right-hand column. The statements should be equivalent to the statements in the left-hand column.

Statements with Assignment Operator	Statements with Combined Assignment Operator
x = x + 5;	x += 5;
total = total + subtotal;	total += subtotal;
dist = dist / rep;	dist /=rep;
ppl = ppl * period;	ppl */period;
inv = inv - shrinkage;	inv -= shrinkage;
num = num % 2;	num %= 2;

14. Write a multiple assignment statement that can be used instead of the following group of assignment statements:

```
east = 1;
west = 1;
north = 1;
south = 1;
```

east = west = north = south = 1;

15. Replace the following statements with a single statement that initializes sum to 0 at the time it is defined.

```
int sum;
sum = 0;
```

int sum = 0;

16. Is the following code legal? Why or why not?

```
const int DAYS_IN_WEEK;
DAYS_IN_WEEK = 7;
```

No, the code is not legal. A named constant must be initialized at the time it is defined. It cannot be defined and then assigned later.

17. Write a cout statement so the variable divSales is displayed in a field of eight spaces, in fixed-point notation, with a decimal point and two decimal digits.

```
cout << fixed << showpoint << setprecision(2);
cout << setw(8) << divSales;
```

18. Which of the following are not valid assignment statements? Write a cout statement so the variable profit is displayed in a field of 12 spaces, in fixed-point notation, with a decimal point and four decimal digits.

```
cout << fixed << showpoint << setprecision(4);
cout << setw(12) << profit;
```

19. What header file must be included

A) cmath to perform mathematical functions like sqrt?

B) fstream to use files?

C) iomanip to use stream manipulators like setprecision?