

1) Give the order of operations in detail.

Parentheses: Left to Right, Inside-Out

Exponents (Powers and Roots): Left to Right

Multiplication and Division: Left to Right

Addition and Subtraction: Left to Right

Simplify the following expressions.

2) $8 - 4 + 6 \cdot 3$

$$8 - 4 + 18$$

$$4 + 18$$

$$\boxed{22}$$

3) $35 \div 5 - 16 \cdot 4$

$$\boxed{-57}$$

4) $(15 + 6) \div 3 - 18$

5) $11 + 6 \cdot 8 \div 12 - 7$

6) $13 + (-17) - (-32) \div 4$

7) $10 \cdot 6 - 15 \div (-3)$

$$13 + (-17) - (-8)$$

$$(-4) - (-8)$$

$$\boxed{4}$$

8) $18 + 6^2 \div 4$

9) $5[(3 + 3^2)^2 \div 8]$

10) $10 + 4^2$

$$5[(3 + 9)^2 \div 8]$$

$$5[(12)^2 \div 8]$$

$$5[144 \div 8]$$

$$5[18]$$

$$\boxed{90}$$

11) $7 + 2 \cdot 5^2 \div 2$

12) $(3 + 8)^2$

13) $8^2 \div 4 + 12$

$$7 + 2 \cdot 25 \div 2$$

$$7 + 50 \div 2$$

$$7 + 25$$

$$\boxed{32}$$

14) $(2^3 + 28) \div 12$

15) $4\sqrt{25} + 12^2 \div (6 \cdot 3)$

16) $6\{(4^2 - 6)^2 - 19\} \div 3^3 + 14$

$$\boxed{28}$$

$$6\{(16 - 6)^2 - 19\} \div 27 + 14$$

$$6\{(10)^2 - 19\} \div 27 + 14$$

$$6\{100 - 19\} \div 27 + 14$$

$$6\{81\} \div 27 + 14$$

$$6\{3\} + 14$$

$$18 + 14 = \boxed{32}$$

Simplify the following powers and roots.

17) 6^2

18) 5^3

19) 8^3

20) 3^4

21) 4^5

36	512	1,024
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22) $\sqrt{36}$

23) $\sqrt{121}$

24) $\sqrt{12}$

25) $\sqrt{45}$

6	$= \sqrt{4 \cdot 3}$ $= 2\sqrt{3}$
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26) $\sqrt[3]{27}$

27) $\sqrt[3]{64}$

28) $\sqrt[3]{24}$

29) $\sqrt[3]{54}$

4	$= \sqrt[3]{8 \cdot 3}$ $= 2\sqrt[3]{3}$
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30) $\sqrt[4]{81}$

31) $\sqrt[4]{625}$

32) $\sqrt[4]{48}$

33) $\sqrt{147}$

3	$= \sqrt[4]{16 \cdot 3}$ $= 2\sqrt[4]{3}$
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