

January Exam Review - Unit 2

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. Write the base of $(-6)^3$. *base*
 a. 6 b. -6 c. -6×3 d. 3
2. Evaluate: 6^5
 a. 30 b. 7776 c. 15 625 d. 11 *$6 \times 6 \times 6 \times 6 \times 6$*
3. Evaluate: $(-4)^4 = -4 \times 4 \times 4 \times 4$
 a. -256 b. -16 c. 16 d. 256
4. Evaluate: $(-5)^7 = (-5) \times (-5) \times (-5) \times (-5) \times (-5) \times (-5) \times (-5)$
 a. -35 b. 35 c. 78 125 d. -78 125
5. Which answer is negative?
 i) $(-7)^8 = +$
 ii) $-(7)^8 = -$
 iii) $-(-7)^8 = -$
 a. i and ii b. i and iii c. ii and iii d. i only
6. Which power is positive?
 i) $(6)^5 = +$
 ii) $(-6)^5 = -$
 iii) $-(6)^5 = -$
 iv) $-(-6)^5 = +$
 a. i and iv b. iii and iv c. i, ii, and iv d. i and ii

iii) $-(-7)^0 = -$

a. i and ii

b. i and iii

c. ii and iii

d. i only

A

6. Which power is positive?

i) $(6)^5 = +$

ii) $(-6)^5 = -$

iii) $-(6)^5 = -$

iv) $-(-6)^5 = +$

a. i and iv

b. iii and iv

c. i, ii, and iv

d. i and ii

B

7. Evaluate: $-8^0 = -1$

a. 1

b. -1

c. 0

d. 8

B

8. Evaluate: $(-13)^0 = 1$

a. 0

b. 1

c. -13

d. -1

A

9. Evaluate: $(-10^3)^0$

a. 1

b. -1

c. -30

d. 30

C

10. Evaluate: $6^5 - 3^3$

a. 6561

b. 9

c. 7749

d. 21

A

11. Evaluate: $(5^3 - 4^2)^0 - (6^2 - 8^0)$

a. -34

b. -35

c. -36

d. 73

B

12. Evaluate: $(3+4)^2 - (2-4)^3$

a. -31

b. 57

c. 20

d. 41

#12 $(3+4)^2 - (2-4)^3$
 $(7)^2 - (-2)^3$
 $49 - (-8)$
 57

#10
 $6^5 - 3^3$
 $7776 - 27$
 7749

#11
 $(5^3 - 4^2)^0 - (6^2 - 8^0)$
 $1 - (36 - 1)$
 $1 - 35$
 -34

i) $-(-5)^0 + 2 \times (-3)^0 - (-2)^0$
 $-1 + 2 \times 1 - 1$
 $-1 + 2 - 1$
 0

ii) $(5 \times 3)^0 - (3-2)^2 + (4-3)^0$
 $1 - (1)^2 + 1$
 $1 - 1 + 1$
 1

iii) $3 - (2 \div 2)^2 - (-4)^0$
 $3 - (1)^2 - 1$
 $3 - 1 - 1$
 1

iv) $(4 \times 2 \div 4) - (3^2 - 5^2)^0 - (-5)$
 $(8 \div 4) - 1 - 1$
 $2 - 1 - 1$
 0

13. Which expression has a value of 0?
 i) $-(-5)^0 + 2 \times (-3)^0 - (-2)^0 = 0$
 ii) $(5 \times 3)^0 - (3-2)^2 + (4-3)^0 = 1$
 iii) $3 - (2 \div 2)^2 - (-4)^0 = 1$
 iv) $(4 \times 2 \div 4) - (3^2 - 5^2)^0 - (-5) = 0$
 a. i, ii, and iv b. ii and iii c. i, iii, and iv **d. i and iv**

14. Write the product of $5^3 \times 5^4$ as a single power. "Keep the base, add the exponents."
a. 5^7 b. 5^{12} c. 10^7 d. 25^7

15. Write the product of $(-7)^7 \times (-7)^3$ as a single power.
a. $(-7)^{10}$ b. $(-14)^{10}$ c. 49^{10} d. $(-7)^{21}$

16. Write the quotient of $\frac{6^{10}}{6^5}$ as a single power. "Keep the base, subtract the exponents."
a. 6^5 b. 6^{15} c. 6^2 d. 2

17. Write the quotient of $(-8)^{15} \div (-8)^5$ as a single power.
 a. 3 b. $(-8)^{20}$ c. $(-8)^3$ **d.** $(-8)^{10}$

18. Express $\frac{(-5)^9 \times (-5)^6}{(-5)^3}$ as a single power. \rightarrow
 a. $(-5)^5$ b. $(-5)^{51}$ c. $(-5)^{12}$

#18

$$\frac{(-5)^{15}}{(-5)^3}$$

a. 6^5 b. 6^{15} c. 6^4 d. 2

D 17. Write the quotient of $(-8)^{15} \div (-8)^5$ as a single power.

a. 3 b. $(-8)^{20}$ c. $(-8)^3$ d. $(-8)^{10}$

C 18. Express $\frac{(-5)^9 \times (-5)^6}{(-5)^3}$ as a single power. \rightarrow

a. $(-5)^5$ b. $(-5)^{51}$ c. $(-5)^{12}$ d. $(-5)^{18}$

C 19. Evaluate: $(-7)^6 \div (-7)^6 = (-7)^0$ Anything to the zero power = 1

a. 0 b. -7 c. 1 d. -1

D 20. Evaluate: $\frac{(5)^8 \times (5)^6}{(5)^{12}} = \frac{(5)^{14}}{(5)^{12}} = (5)^2 = 25$

a. 10 b. 4 c. 2 d. 25

C 21. Evaluate: $(-2)^5 \times (-2)^3 \div (-2)^0 \rightarrow$

a. -128 b. -256 c. 256 d. -32 768

D 22. Which expressions have positive values?

i) $[(-5)^2]^7 = (-5)^{14} = +$
 ii) $[-(-5)^2]^7 = -(-5)^{14} = -$
 iii) $-(5^2)^7 = -$
 iv) $-[-(-5)^2]^7 = +$

a. ii and iv b. ii and iii c. i and ii d. i and iv

#18

$$\frac{(-5)^{15}}{(-5)^3} = (-5)^{12}$$

#21

$$\begin{aligned} &(-2)^5 \times (-2)^3 \div (-2)^0 \\ &= (-2)^8 \div (-2)^0 \\ &= (-2)^8 \\ &= 256 \end{aligned}$$

A 23. Which expressions have negative values?

i) $\left[-(-3)^5\right]^5 = -(-3)^{25} = +$

ii) $\left(-3^5\right)^5 = -3^{25} = -$

iii) $\left[(-3)^5\right]^5 = (-3)^{25} = -$

iv) $- \left[(-3)^5\right]^5 = +$

a. ii and iii

b. i and ii

c. i and iv

d. iii and iv

Short Answer

24. Which answers are positive?

i) $(5)^3 = +$

ii) $(-7)^6 = +$

iii) $(-3)^7 = -$

iv) $(-6)^3 = -$

25. Evaluate: $\frac{5^3 \times (2+4)^2 \times 6(-9)^0}{(-4)^0 \times 6^3 \times (7-2)^2}$

26. Simplify, then evaluate.

$\frac{(-2)^6 \times (-2)^2}{(-2)^3 \times (-2)^0}$

#25

Top "Numerator"

$5^3 \times (2+4)^2 \times 6(-9)^0$

$5^3 \times (6)^2 \times 6(1)$

$125 \times 36 \times 6$

27000

Bottom "Denominator"

$- (4)^0 \times 6^3 \times (7-2)^2$

$- (1) \times 216 \times (5)^2$

$- 1 \times 216 \times 25$

$- 216 \times 25$

5400

$\frac{27000}{5400}$

5

125 x 36 x 6
27000

-216 x 25
5400

25. Evaluate: $\frac{5^3 \times (2+4)^2 \times 6(-9)^0}{(-4)^0 \times 6^3 \times (7-2)^2}$

26. Simplify, then evaluate.
 $\frac{(-2)^6 \times (-2)^2}{(-2)^3 \times (-2)^0}$

27. Simplify, then evaluate.
 $\frac{(2^4)^3 \times (2^2)^4}{(2^4 \times 2^4)^2}$

28. Simplify, then evaluate.
 $(4^6 + 4^3)^2 - (2^8 - 2^6)^2$

29. Simplify, then evaluate.
 $[(-2)^4 \times (-2)^3] - [(-3)^4 + (-3)^3]$

125 x 36 x 6
27000

-216 x 25
5400

$\frac{27000}{5400} = 5$

26 $\frac{(-2)^8}{(-2)^3} = (-2)^5 = -32$

27 $\frac{2^{12} \times 2^8}{(2^3)^2} = \frac{2^{20}}{2^6} = 2^{14} = 16384$

$(4^6 + 4^3)^2 - (2^8 - 2^6)^2$
 $(4^3)^2 - (2^2)^2$
 $4^6 - 2^4$
 $4096 - 16 = 4080$

Problem

Evaluate: $\frac{(15)^2 - (6)^2}{(9)^2 - 2(3)^2}$ Show your calculations.

$\frac{225 - 36}{81 - 2(9)} = \frac{189}{63} = 3$

$(-2)^7 - (-3)^1$
 $-128 - -3$
 $-128 + 3$
 -125

Powers: Unit 2

Helpful Hints for the Test:

Simplify - use exponent laws to make the question smaller

Evaluate - Calculate the answer

| | |
|--|--|
| $(-3)^4$ | -3^5 |
| $(-3) \times (-3) \times (-3) \times (-3)$ | $-3 \times 3 \times 3 \times 3 \times 3$ |

Powers with the Same Base

① $(3)^2 \times (3)^7$
 3^{2+7}
 $(3)^9$

→ when you multiply powers with the same base ADD exponents

Power of a Power

Multiply exponents

$(3^5)^4$
 $3^{5 \times 4}$
 3^{20}

Product of Powers:

$(3 \times 7)^2$
 $3^2 \times 7^2$

Product of Quotients:

$\left(\frac{4}{7}\right)^3 = \frac{4^3}{7^3}$

② $\frac{4^7}{4^2} = 4^{7-2} = 4^5$

→ when you Divide powers with the same base, SUBTRACT Exponents

Write using a power of tens

456
 $(4 \times 10^2) + (5 \times 10^1) + (6 \times 10^0)$

$(3 \times 10^4) + (5 \times 10^3) + (2 \times 10^0)$
 $30\,000 + 5\,000 + 2$
 $35\,002$

Order of Operations:
 BEDMAS

Simplify → means use your exponent

→ When you Divide powers with the same base, SUBTRACT Exponents

| | |
|---|---|
| Write using a power of tens 456 $(4 \times 10^2) + (5 \times 10^1) + (6 \times 10^0)$ | $(3 \times 10^4) + (5 \times 10^3) + (2 \times 10^0)$ 30 000 + 5 000 + 2 35 002 |
|---|---|

Order of Operations:
BEDMAS

① $(2 \times 3)^2 + 10^8 \times 10^4 \div 10^{10}$
 $(6)^2 + 10^8 \times 10^4 \div 10^{10}$
 $(6)^2 + 10^{12} \div 10^{10}$
 36 + 10^2
 36 + 100
 136

② $3 + 2 \times 4 \div 2^2 + (9 \times 3)$
 $3 + 2 \times 4 \div 2^2 + 27$
 $3 + 2 \times 4 \div 4 + 27$
 $3 + 8 \div 4 + 27$

Simplify → means use your exponent laws

$$= \frac{2^5 \times 2^7}{2^{10}} + 7$$

$$= \frac{2^{12}}{2^{10}} + 7$$

$$= 2^2 + 7$$

$$= 4 + 7$$

No more laws so now evaluate