

1. Which of the following is equivalent to the expression $(2x^4 - 5x^4)^2$?

A) $-21x^8$

B) $-6x^8$

C) $9x^8$

D) $9x^{16}$

$$\begin{aligned} (-3x^4)^2 &= (-3)^2 x^{4 \cdot 2} \\ &= 9x^8 \end{aligned}$$

2. Which of the following is equivalent to

$$(2b^3c^2 + b^2c - 4bc) - (b^3c^2 - b^2c - 4bc)?$$

A) 0

B) b^3c^2

C) $b^3c^2 + 2b^2c$

D) $b^3c^2 + 2b^2c - 8bc$

$$\begin{aligned} &2b^3c^2 + b^2c - 4bc \\ &- b^3c^2 + b^2c + 4bc \end{aligned}$$

$$b^3c^2 + 2b^2c$$

3. When completely simplified, $\frac{25^4 \times 5^2}{25^5}$ has a value of:

- A) 0
 (B) 1
 C) 5
 D) 25

$$\frac{25^4 \times 25^1}{25^5} = \frac{25^5}{25^5} = 1$$

4. Which of the following is equivalent to

$x^{\frac{5}{7}}$, for all values of x ?

- A) $\frac{5}{x^7}$
 B) $\frac{1}{x^2}$
 C) $\sqrt[5]{x^7}$
 (D) $\sqrt[7]{x^5}$

$$\sqrt[7]{x^5}$$

$$x^{\frac{a}{b}} = \sqrt[b]{x^a}$$

5. Which of the following is the expanded form of $4(5x + 3)(2x - 1)$?



A) $40x^2 + 12$

B) $40x^2 - 12$

C) $40x^2 - 4x + 12$

D) $40x^2 + 4x - 12$

$$4(10x^2 - 5x + 6x - 3)$$

$$= 4(10x^2 + x - 3)$$

$$= 40x^2 + 4x - 12$$

6. If $\frac{a^{x^2}}{a^{(x^2-y^2)}} = a^4$ and $y > 0$, what is the value of y ?

A) 0

B) 1

C) 2

D) 4

$$a^{x^2 - (x^2 - y^2)} = a^4$$

$$a^{x^2 - x^2 + y^2} = a^4$$

$$a^{y^2} = a^4$$

$$y^2 = 4 \rightarrow y = \pm 2$$

7. Which sequence of steps correctly gives the value of $4^{\frac{3}{2}}$ and algebraically justifies the value?

~~A)~~ $4^{\frac{3}{2}} = (4^2)^{\frac{1}{3}} = \sqrt[3]{4^2} = \sqrt[3]{16}$

~~B)~~ $4^{\frac{3}{2}} = (4^2) \div 3 = 16 \div 3 = \frac{16}{3}$

~~C)~~ $4^{\frac{3}{2}} = (4^3) \div 2 = 64 \div 2 = 32$

D) $4^{\frac{3}{2}} = (4^3)^{\frac{1}{2}} = \sqrt{4^3} = \sqrt{64} = 8$

8. What is the factored form of

$$16x^6 - 8x^3y^3 + y^6?$$

$$x=1$$

$$y=1$$

A) $(4x^3 - y^3)^2$

B) $(4x^3 + y^3)^2$

C) $(4x + y)^6$

D) $(16x^2 + y)^3$

$$16 - 8 + 1 = 9$$

$$16x^6 - 4x^3y^3 - 4x^3y^3 + y^6$$

$$4x^3(4x^3 - y^3) - y^3(4x^3 - y^3)$$

$$(4x^3 - y^3)(4x^3 - y^3)$$