

Question ID ca38bb3c

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Advanced Math	Equivalent expressions	<div><div></div><div></div><div></div></div>

ID: ca38bb3c

Which of the following expressions is equivalent to $8x^{10} - 8x^9 + 88x$?

- A. $x(7x^{10} - 7x^9 + 87x)$
- B. $x(8^{10} - 8^9 + 88)$
- C. $8x(x^{10} - x^9 + 11x)$
- D. $8x(x^9 - x^8 + 11)$

ID: ca38bb3c Answer

Correct Answer: D

Rationale

Choice D is correct. Since $8x$ is a common factor of each term in the given expression, the expression can be rewritten as $8xx^9 - x^8 + 11$.

Choice A is incorrect. This expression is equivalent to $7x^{11} - 7x^{10} + 87x^2$.

Choice B is incorrect. This expression is equivalent to $8^{10}x - 8^9x + 88x$.

Choice C is incorrect. This expression is equivalent to $8x^{11} - 8x^{10} + 88x^2$.

Question Difficulty: Medium

Question ID de4fecb4

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Advanced Math	Equivalent expressions	<div><div></div><div></div><div></div></div>

ID: de4fecb4

Which expression is equivalent to $(7x^3 + 7x) - (6x^3 - 3x)$?

- A. $x^3 + 10x$
- B. $-13x^3 + 10x$
- C. $-13x^3 + 4x$
- D. $x^3 + 4x$

ID: de4fecb4 Answer

Correct Answer: A

Rationale

Choice A is correct. Applying the distributive property, the given expression can be written as $7x^3 + 7x - 6x^3 + 3x$. Grouping like terms in this expression yields $7x^3 - 6x^3 + 7x + 3x$. Combining like terms in this expression yields $x^3 + 10x$.

Choice B is incorrect and may result from conceptual or calculation errors.

Choice C is incorrect and may result from conceptual or calculation errors.

Choice D is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Medium

Question ID 9064989a

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Advanced Math	Equivalent expressions	<div><div></div><div></div><div></div></div>

ID: 9064989a

Which expression is equivalent to $17(x^2 - 100y^2)$?

- A. $17(x - 2y)(x - 50y)$
- B. $17(x - 2y)(x + 50y)$
- C. $17(x - 10y)(x - 10y)$
- D. $17(x - 10y)(x + 10y)$

ID: 9064989a Answer

Correct Answer: D

Rationale

Choice D is correct. Expressions in the form $a^2 - b^2$ follow the difference of two squares pattern and can be factored as $(a - b)(a + b)$. In the given expression, $17(x^2 - 100y^2)$, the expression $x^2 - 100y^2$ follows the difference of two squares pattern. It follows that the expression $x^2 - 100y^2$ can be rewritten as $(x - 10y)(x + 10y)$. Therefore, the expression $17(x - 10y)(x + 10y)$ is equivalent to $17(x^2 - 100y^2)$.

Choice A is incorrect. This expression is equivalent to $17(x^2 - 52xy + 100y^2)$, not $17(x^2 - 100y^2)$.

Choice B is incorrect. This expression is equivalent to $17(x^2 + 48xy - 100y^2)$, not $17(x^2 - 100y^2)$.

Choice C is incorrect. This expression is equivalent to $17(x^2 - 20xy + 100y^2)$, not $17(x^2 - 100y^2)$.

Question Difficulty: Medium

Question ID b4b27aa2

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Advanced Math	Equivalent expressions	<div><div></div><div></div><div></div></div>

ID: b4b27aa2

Which expression is equivalent to $(m^4q^4z^{-1})(mq^5z^3)$, where m , q , and z are positive?

- A. $m^4q^{20}z^{-3}$
- B. $m^5q^9z^2$
- C. $m^6q^8z^{-1}$
- D. $m^{20}q^{12}z^{-2}$

ID: b4b27aa2 Answer

Correct Answer: B

Rationale

Choice B is correct. Applying the commutative property of multiplication, the expression $m^4q^4z^{-1}mq^5z^3$ can be rewritten as $m^4mq^4q^5z^{-1}z^3$. For positive values of x , $x^ax^b = x^{a+b}$. Therefore, the expression $m^4mq^4q^5z^{-1}z^3$ can be rewritten as $m^{4+1}q^{4+5}z^{-1+3}$, or $m^5q^9z^2$.

Choice A is incorrect and may result from multiplying, not adding, the exponents.

Choice C is incorrect and may result from conceptual or calculation errors.

Choice D is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Medium

Question ID 83a6080a

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Advanced Math	Equivalent expressions	<div><div></div><div></div><div></div></div>

ID: 83a6080a

Which expression is equivalent to $(x^2 + 11)^2 + (x - 5)(x + 5)$?

- A. $x^4 + 23x^2 - 14$
- B. $x^4 + 23x^2 + 96$
- C. $x^4 + 12x^2 + 121$
- D. $x^4 + x^2 + 146$

ID: 83a6080a Answer

Correct Answer: B

Rationale

Choice B is correct. The expression $x^2 + 11^2$ can be written as $x^2 + 11x^2 + 11$, which is equivalent to $x^2x^2 + 11 + 11x^2 + 11$. Distributing x^2 and 11 to $x^2 + 11$ yields $x^4 + 11x^2 + 11x^2 + 121$, or $x^4 + 22x^2 + 121$. The expression $x - 5x + 5$ is equivalent to $x - 5x + x - 55$. Distributing x and 5 to $x - 5$ yields $x^2 - 5x + 5x - 25$, or $x^2 - 25$. Therefore, the expression $x^2 + 11^2 + x - 5x + 5$ is equivalent to $x^4 + 22x^2 + 121 + x^2 - 25$, or $x^4 + 22x^2 + 121 + x^2 - 25$. Combining like terms in this expression yields $x^4 + 23x^2 + 96$.

Choice A is incorrect. Equivalent expressions must be equivalent for any value of x . Substituting 0 for x in this expression yields -14, whereas substituting 0 for x in the given expression yields 96.

Choice C is incorrect. Equivalent expressions must be equivalent for any value of x . Substituting 0 for x in this expression yields 121, whereas substituting 0 for x in the given expression yields 96.

Choice D is incorrect. Equivalent expressions must be equivalent for any value of x . Substituting 0 for x in this expression yields 146, whereas substituting 0 for x in the given expression yields 96.

Question Difficulty: Medium

Question ID ec396a63

Assessment	Test	Domain	Skill	Difficulty
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ID: ec396a63

Which expression is equivalent to $(8x^3 + 8) - (x^3 - 2)$?

- A. $8x^3 + 6$
- B. $7x^3 + 10$
- C. $8x^3 + 10$
- D. $7x^3 + 6$

ID: ec396a63 Answer

Correct Answer: B

Rationale

Choice B is correct. The given expression is equivalent to $8x^3 + 8 - x^3 - -2$, or $8x^3 + 8 - x^3 + 2$. Combining like terms in this expression yields $7x^3 + 10$.

Choice A is incorrect. This expression is equivalent to $8x^3 + 8 - 2$, not $8x^3 + 8 - x^3 - 2$.

Choice C is incorrect. This expression is equivalent to $8x^3 + 8 - -2$, not $8x^3 + 8 - x^3 - 2$.

Choice D is incorrect. This expression is equivalent to $8x^3 + 8 - x^3 + 2$, not $8x^3 + 8 - x^3 - 2$.

Question Difficulty: Medium

Question ID 8f7cb906

Assessment	Test	Domain	Skill	Difficulty
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ID: 8f7cb906

The expression $90y^5 - 54y^4$ is equivalent to $ry^4(15y - 9)$, where r is a constant. What is the value of r ?

ID: 8f7cb906 Answer

Correct Answer: 6

Rationale

The correct answer is 6. Applying the distributive property to the expression $ry^415y - 9$ yields $15ry^5 - 9ry^4$. Since $90y^5 - 54y^4$ is equivalent to $ry^415y - 9$, it follows that $90y^5 - 54y^4$ is also equivalent to $15ry^5 - 9ry^4$. Since these expressions are equivalent, it follows that corresponding coefficients are equivalent. Therefore, $90 = 15r$ and $-54 = -9r$. Solving either of these equations for r will yield the value of r . Dividing both sides of $90 = 15r$ by 15 yields $6 = r$. Therefore, the value of r is 6.

Question Difficulty: Medium

Question ID 993dd564

Assessment	Test	Domain	Skill	Difficulty
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ID: 993dd564

Which expression is equivalent to $(d - 6)(8d^2 - 3)$?

- A. $8d^3 - 14d^2 - 3d + 18$
- B. $8d^3 - 17d^2 + 48$
- C. $8d^3 - 48d^2 - 3d + 18$
- D. $8d^3 - 51d^2 + 48$

ID: 993dd564 Answer

Correct Answer: C

Rationale

Choice C is correct. Applying the distributive property to the given expression yields $d8d^2 - 3 - 68d^2 - 3$. Applying the distributive property once again to this expression yields $d8d^2 + d-3 + -68d^2 + -6-3$, or $8d^3 + -3d + -48d^2 + 18$. This expression can be rewritten as $8d^3 - 48d^2 - 3d + 18$. Thus, $d - 68d^2 - 3$ is equivalent to $8d^3 - 48d^2 - 3d + 18$.

Choice A is incorrect and may result from conceptual or calculation errors.

Choice B is incorrect and may result from conceptual or calculation errors.

Choice D is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Medium

Question ID 996ee9fc

Assessment	Test	Domain	Skill	Difficulty
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ID: 996ee9fc

Which expression is a factor of $2x^2 + 38x + 10$?

- A. 2
- B. $5x$
- C. $38x$
- D. $2x^2$

ID: 996ee9fc Answer

Correct Answer: A

Rationale

Choice A is correct. Since 2 is a common factor of each of the terms in the given expression, the expression can be rewritten as $2x^2 + 19x + 5$. Therefore, the factors of the given expression are 2 and $x^2 + 19x + 5$. Of these two factors, only 2 is listed as a choice.

Choice B is incorrect and may result from conceptual or calculation errors.

Choice C is incorrect. This is a term of the given expression, not a factor of the given expression.

Choice D is incorrect. This is a term of the given expression, not a factor of the given expression.

Question Difficulty: Medium