Question ID 371cbf6b

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: 371cbf6b

$$(ax+3)(5x^2-bx+4)=20x^3-9x^2-2x+12$$

The equation above is true for all x, where a and b are constants. What is the value of ab ?

A. 18

B. 20

C. 24

D. 40

ID: 371cbf6b Answer

Correct Answer: C

Rationale

Choice C is correct. If the equation is true for all x, then the expressions on both sides of the equation will be equivalent. Multiplying the polynomials on the left-hand side of the equation gives $5ax^3-abx^2+4ax+15x^2-3bx+12$. On the right-hand side of the equation, the only x^2-term is $-9x^2$. Since the expressions on both sides of the equation are equivalent, it follows that $-abx^2+15x^2=-9x^2$, which can be rewritten as $(-ab+15)x^2=-9x^2$. Therefore, $-ab+15=-9$, which gives $ab=24$.

Choice A is incorrect. If $ab=18$, then the coefficient of x^2 on the left-hand side of the equation would be $-18+15=-3$, which doesn't equal the coefficient of x^2, -9, on the right-hand side. Choice B is incorrect. If $ab=20$, then the coefficient of x^2 on the left-hand side of the equation would be $-20+15=-5$, which doesn't equal the coefficient of x^2, -9, on the right-hand side. Choice D is incorrect. If $ab=40$, then the coefficient of x^2 on the left-hand side of the equation would be $-40+15=-25$, which doesn't equal the coefficient of x^2, -9, on the right-hand side.

Question Difficulty: Hard

Question ID 40c09d66

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: 40c09d66

If $\frac{\sqrt{x^5}}{\sqrt[3]{x^4}} = x^{\frac{a}{b}}$ for all positive values of x, what is the value of $\frac{a}{b}$?

ID: 40c09d66 Answer

Rationale

The correct answer is $\frac{7}{6}$. The value of $\frac{a}{b}$ can be found by first rewriting the left-hand side of the given equation as $\frac{x^{\frac{5}{2}}}{x^{\frac{4}{3}}}$. Using the properties of exponents, this expression can be rewritten as $x^{\left(\frac{5}{2}-\frac{4}{3}\right)}$. This expression can be rewritten by subtracting the fractions in the exponent, which yields $x^{\frac{7}{6}}$. Thus, $\frac{a}{b}$ is $\frac{7}{6}$. Note that 7/6, 1.166, and 1.167 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID 34847f8a

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: 34847f8a

$$\frac{2}{x-2}+\frac{3}{x+5}=\frac{rx+t}{(x-2)(x+5)}$$

The equation above is true for all $x>2$, where r and t are positive constants. What is the value of rt ?

A. -20

B. 15

C. 20

D. 60

ID: 34847f8a Answer

Correct Answer: C

Rationale

Choice C is correct. To express the sum of the two rational expressions on the left-hand side of the equation as the single rational expression on the right-hand side of the equation, the expressions on the left-hand side must have the same denominator. Multiplying the first expression by $\frac{x+5}{x-5}$ results in $\frac{2(x+5)}{(x-2)(x+5)}$, and multiplying the second expression by $\frac{x-2}{x-2}$ results in $\frac{3(x-2)}{(x-2)(x+5)}$, so the given equation can be rewritten as $\frac{2(x+5)}{(x-2)(x+5)}+\frac{3(x-2)}{(x-2)(x+5)}=\frac{rx+t}{(x-2)(x+5)}$, or $\frac{2x+10}{(x-2)(x+5)}+\frac{3x-6}{(x-2)(x+5)}=\frac{rx+t}{(x-2)(x+5)}$. Since the two rational expressions on the left-hand side of the equation have the same denominator as the rational expression on the right-hand side of the equation, it follows that $(2x+10)+(3x-6)=rx+t$. Combining like terms on the left-hand side yields $5x+4=rx+t$, so it follows that $r=5$ and $t=4$. Therefore, the value of rt is $(5)(4)=20$.

Choice A is incorrect and may result from an error when determining the sign of either r or t. Choice B is incorrect and may result from not distributing the 2 and 3 to their respective terms in $\frac{2(x+5)}{(x-2)(x+5)}+\frac{3(x-2)}{(x-2)(x+5)}=\frac{rx+t}{(x-2)(x+5)}$. Choice D is incorrect and may result from a calculation error.

Question Difficulty: Hard

Question ID 137cc6fd

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	

ID: 137cc6fd

$$\sqrt[5]{70n}\left(\sqrt[6]{70n}\right)^2$$

For what value of x is the given expression equivalent to $(70n)^{30x}$, where $n > 1$?

ID: 137cc6fd Answer

Correct Answer: .0177, .0178, 4/225

Rationale

The correct answer is $\frac{4}{225}$. An expression of the form $\sqrt[k]{a}$, where k is an integer greater than 1 and $a \geq 0$, is equivalent to $a^{\frac{1}{k}}$. Therefore, the given expression, where $n > 1$, is equivalent to $70n^{\frac{1}{5}}70n^{\frac{1}{6}}{}^{2}$. Applying properties of exponents, this expression can be rewritten as $70n^{\frac{1}{5}}70n^{\frac{1}{6}\cdot 2}$, or $70n^{\frac{1}{5}}70n^{\frac{1}{3}}$, which can be rewritten as $70n^{\frac{1}{5}+\frac{1}{3}}$, or $70n^{\frac{8}{15}}$. It's given that the expression $\sqrt[5]{70n}\sqrt[6]{70n}^{2}$ is equivalent to $70n^{30x}$, where $n > 1$. It follows that $70n^{\frac{8}{15}}$ is equivalent to $70n^{30x}$. Therefore, $\frac{8}{15} = 30x$. Dividing both sides of this equation by 30 yields $\frac{8}{450} = x$, or $\frac{4}{225} = x$. Thus, the value of x for which the given expression is equivalent to $70n^{30x}$, where $n > 1$, is $\frac{4}{225}$. Note that 4/225, .0177, .0178, 0.017, and 0.018 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID ea6d05bb

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: ea6d05bb

The expression $(3x-23)(19x+6)$ is equivalent to the expression ax^2+bx+c, where a, b, and c are constants. What is the value of b?

ID: ea6d05bb Answer

Correct Answer: -419

Rationale

The correct answer is -419. It's given that the expression $3x$ - $2319x+6$ is equivalent to the expression ax^2+bx+c, where a, b, and c are constants. Applying the distributive property to the given expression, $3x$ - $2319x+6$, yields $3x19x+3x6$ - $2319x$ - 236, which can be rewritten as $57x^2+18x$ - $437x$ - 138. Combining like terms yields $57x^2$ - $419x$ - 138. Since this expression is equivalent to ax^2+bx+c, it follows that the value of b is -419.

Question Difficulty: Hard

Question ID d8789a4c

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: d8789a4c

$$\frac{x^2 - c}{x - b}$$

In the expression above, b and c are positive integers. If the expression is equivalent to $x + b$ and $x \neq b$, which of the following could be the value of c ?

A. 4

B. 6

C. 8

D. 10

ID: d8789a4c Answer

Correct Answer: A

Rationale

Choice A is correct. If the given expression is equivalent to $x + b$, then $\frac{x^2 - c}{x - b} = x + b$, where x isn't equal to b. Multiplying both sides of this equation by $x - b$ yields $x^2 - c = (x + b)(x - b)$. Since the right-hand side of this equation is in factored form for the difference of squares, the value of c must be a perfect square. Only choice A gives a perfect square for the value of c.

Choices B, C, and D are incorrect. None of these values of c produces a difference of squares. For example, when 6 is substituted for c in the given expression, the result is $\frac{x^2 - 6}{x - b}$. The expression $x^2 - 6$ can't be factored with integer values, and therefore $\frac{x^2 - 6}{x - b}$ isn't equivalent to $x + b$.

Question Difficulty: Hard

Question ID 5355c0ef

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: 5355c0ef

$$0.36x^2 + 0.63x + 1.17$$

The given expression can be rewritten as $a\left(4x^2 + 7x + 13\right)$, where a is a constant. What is the value of a?

ID: 5355c0ef Answer

Correct Answer: .09, 9/100

Rationale

The correct answer is $.09$. It's given that the expression $0.36x^2 + 0.63x + 1.17$ can be rewritten as $a4x^2 + 7x + 13$. Applying the distributive property to the expression $a4x^2 + 7x + 13$ yields $4ax^2 + 7ax + 13a$. Therefore, $0.36x^2 + 0.63x + 1.17$ can be rewritten as $4ax^2 + 7ax + 13a$. It follows that in the expressions $0.36x^2 + 0.63x + 1.17$ and $4ax^2 + 7ax + 13a$, the coefficients of x^2 are equivalent, the coefficients of x are equivalent, and the constant terms are equivalent. Therefore, $0.36 = 4a$, $0.63 = 7a$, and $1.17 = 13a$. Solving any of these equations for a yields the value of a. Dividing both sides of the equation $0.36 = 4a$ by 4 yields $0.09 = a$. Therefore, the value of a is 0.09. Note that .09 and 9/100 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID c81b6c57

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: c81b6c57

In the expression $3(2x^2+px+8)-16x(p+4)$, p is a constant. This expression is equivalent to the expression $6x^2-155x+24$. What is the value of p ?

A. -3

B. 7

C. 13

D. 155

ID: c81b6c57 Answer

Correct Answer: B

Rationale

Choice B is correct. Using the distributive property, the first given expression can be rewritten as $6x^2 + 3px + 24 - 16px - 64x + 24$, and then rewritten as $6x^2 + (3p - 16p - 64)x + 24$. Since the expression $6x^2 + (3p - 16p - 64)x + 24$ is equivalent to $6x^2 - 155x + 24$, the coefficients of the x terms from each expression are equivalent to each other; thus $3p - 16p - 64 = -155$. Combining like terms gives $-13p - 64 = -155$. Adding 64 to both sides of the equation gives $-13p = -71$. Dividing both sides of the equation by -13 yields $p = 7$.

Choice A is incorrect. If $p = -3$, then the first expression would be equivalent to $6x^2 - 25x + 24$. Choice C is incorrect. If $p = 13$, then the first expression would be equivalent to $6x^2 - 233x + 24$. Choice D is incorrect. If $p = 155$, then the first expression would be equivalent to $6x^2 - 2{,}079x + 24$.

Question Difficulty: Hard

Question ID 2c88af4d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: 2c88af4d

The expression $\frac{x^{-2}y^{\frac{1}{2}}}{x^{\frac{1}{3}}y^{-1}}$, where $x>1$ and $y>1$, is equivalent to which of the following?

A. $\frac{\sqrt{y}}{\sqrt[3]{x^2}}$

B. $\frac{y\sqrt{y}}{\sqrt[3]{x^2}}$

C. $\frac{y\sqrt{y}}{x\sqrt{x}}$

D. $\frac{y\sqrt{y}}{x^2\sqrt[3]{x}}$

ID: 2c88af4d Answer

Correct Answer: D

Rationale

Choice D is correct. For $x>1$ and $y>1$, $x^{\frac{1}{3}}$ and $y^{\frac{1}{2}}$ are equivalent to $\sqrt[3]{x}$ and $\sqrt{y}$, respectively. Also, x^{-2} and y^{-1} are equivalent to $\frac{1}{x^2}$ and $\frac{1}{y}$, respectively. Therefore, the given expression can be rewritten as $\frac{y\sqrt{y}}{x^2\sqrt[3]{x}}$.

Choices A, B, and C are incorrect because these choices are not equivalent to the given expression for $x>1$ and $y>1$.

For example, for $x=2$ and $y=2$, the value of the given expression is $2^{-\frac{5}{6}}$; the values of the choices, however, are $2^{-\frac{1}{3}}$, $2^{\frac{5}{6}}$, and 1, respectively.

Question Difficulty: Hard

Question ID 22fd3e1f

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: 22fd3e1f

$$f(x) = x^3 - 9x$$
$$g(x) = x^2 - 2x - 3$$

Which of the following expressions is equivalent to $\frac{f(x)}{g(x)}$, for $x > 3$?

A. $\frac{1}{x+1}$

B. $\frac{x+3}{x+1}$

C. $\frac{x(x-3)}{x+1}$

D. $\frac{x(x+3)}{x+1}$

ID: 22fd3e1f Answer

Correct Answer: D

Rationale

Choice D is correct. Since $x^3 - 9x = x(x+3)(x-3)$ and $x^2 - 2x - 3 = (x+1)(x-3)$, the fraction $\frac{f(x)}{g(x)}$ can be written as $\frac{x(x+3)(x-3)}{(x+1)(x-3)}$. It is given that $x > 3$, so the common factor $x - 3$ is not equal to 0. Therefore, the fraction can be further simplified to $\frac{x(x+3)}{x+1}$.

Choice A is incorrect. The expression $\frac{1}{x+1}$ is not equivalent to $\frac{f(x)}{g(x)}$ because at $x = 0$, $\frac{1}{x+1}$ as a value of 1 and $\frac{f(x)}{g(x)}$ has a value of 0.

Choice B is incorrect and results from omitting the factor x in the factorization of $f(x)$. Choice C is incorrect and may result from incorrectly factoring $g(x)$ as $(x+1)(x+3)$ instead of $(x+1)(x-3)$.

Question Difficulty: Hard

Question ID a0b4103e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: a0b4103e

The expression $\frac{1}{3}x^2 - 2$ can be rewritten as $\frac{1}{3}(x-k)(x+k)$, where k is a positive constant. What is the value of k ?

A. 2

B. 6

C. $\sqrt{2}$

D. $\sqrt{6}$

ID: a0b4103e Answer

Correct Answer: D

Rationale

Choice D is correct. Factoring out the coefficient $\frac{1}{3}$, the given expression can be rewritten as $\frac{1}{3}(x^2 - 6)$. The expression $x^2 - 6$ can be approached as a difference of squares and rewritten as $(x-\sqrt{6})(x+\sqrt{6})$. Therefore, k must be $\sqrt{6}$.

Choice A is incorrect. If k were 2, then the expression given would be rewritten as $\frac{1}{3}(x-2)(x+2)$, which is equivalent to $\frac{1}{3}x^2 - \frac{4}{3}$, not $\frac{1}{3}x^2 - 2$.

Choice B is incorrect. This may result from incorrectly factoring the expression and finding $(x-6)(x+6)$ as the factored form of the expression. Choice C is incorrect. This may result from incorrectly distributing the $\frac{1}{3}$ and rewriting the expression as $\frac{1}{3}(x^2 - 2)$.

Question Difficulty: Hard

Question ID ad038c19

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: ad038c19

Which of the following is equivalent to $\left(a+\frac{b}{2}\right)^2$?

A. $a^2+\frac{b^2}{2}$

B. $a^2+\frac{b^2}{4}$

C. $a^2+\frac{ab}{2}+\frac{b^2}{2}$

D. $a^2+ab+\frac{b^2}{4}$

ID: ad038c19 Answer

Correct Answer: D

Rationale

Choice D is correct. The expression $\left(a+\frac{b}{2}\right)^2$ can be rewritten as $\left(a+\frac{b}{2}\right)\left(a+\frac{b}{2}\right)$. Using the distributive property, the expression yields $\left(a+\frac{b}{2}\right)\left(a+\frac{b}{2}\right)=a^2+\frac{ab}{2}+\frac{ab}{2}+\frac{b^2}{4}$. Combining like terms gives $a^2+ab+\frac{b^2}{4}$.

Choices A, B, and C are incorrect and may result from errors using the distributive property on the given expression or combining like terms.

Question Difficulty: Hard

Question ID 20291f47

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: 20291f47

Which expression is equivalent to $\frac{y+12}{x-8}+\frac{y(x-8)}{x^2y-8xy}$?

A. $\frac{xy+y+4}{x^3y-16x^2y+64xy}$

B. $\frac{xy+9y+12}{x^2y-8xy+x-8}$

C. $\frac{xy^2+13xy-8y}{x^2y-8xy}$

D. $\frac{xy^2+13xy-8y}{x^3y-16x^2y+64xy}$

ID: 20291f47 Answer

Correct Answer: C

Rationale

Choice C is correct. Factoring the denominator in the second term of the given expression gives $\frac{y+12}{x-8}+\frac{yx-8}{xyx-8}$. This expression can be rewritten with common denominators by multiplying the first term by $\frac{xy}{xy}$, giving $\frac{xyy+12}{xyx-8}+\frac{yx-8}{xyx-8}$. Adding these two terms yields $\frac{xyy+12+yx-8}{xyx-8}$. Using the distributive property to rewrite this expression gives $\frac{xy^2+12xy+xy-8y}{x^2y-8xy}$. Combining the like terms in the numerator of this expression gives $\frac{xy^2+13xy-8y}{x^2y-8xy}$.

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: Hard

Question ID 12e7faf8

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: 12e7faf8

The equation $\dfrac{x^2+6x-7}{x+7}=ax+d$ is true for all $x \neq -7$, where *a* and *d* are integers. What is the value of $a+d$?

A. -6

B. -1

C. 0

D. 1

ID: 12e7faf8 Answer

Correct Answer: C

Rationale

Choice C is correct. Since the expression x^2+6x-7 can be factored as $(x+7)(x-1)$, the given equation can be rewritten as $\dfrac{(x+7)(x-1)}{x+7}=ax+d$. Since $x \neq -7$, $x+7$ is also not equal to 0, so both the numerator and denominator of $\dfrac{(x+7)(x-1)}{x+7}$ can be divided by $x+7$. This gives $x-1=ax+d$. Equating the coefficient of x on each side of the equation gives $a=1$. Equating the constant terms gives $d=-1$. The sum is $1+(-1)=0$.

Choice A is incorrect and may result from incorrectly simplifying the equation. Choices B and D are incorrect. They are the values of d and a, respectively, not $a+d$.

Question Difficulty: Hard

Question ID 89fc23af

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: 89fc23af

Which of the following expressions is equivalent to $\frac{x^2-2x-5}{x-3}$?

A. $x - 5 - \frac{20}{x-3}$

B. $x - 5 - \frac{10}{x-3}$

C. $x + 1 - \frac{8}{x-3}$

D. $x + 1 - \frac{2}{x-3}$

ID: 89fc23af Answer

Correct Answer: D

Rationale

Choice D is correct. The numerator of the given expression can be rewritten in terms of the denominator, $x-3$, as follows: $x^2-2x-5=x^2-3x+x-3-2$, which is equivalent to $x(x-3)+(x-3)-2$. So the given expression is equivalent to $\frac{x(x-3)+(x-3)-2}{x-3}=\frac{x(x-3)}{x-3}+\frac{x-3}{x-3}-\frac{2}{x-3}$. Since the given expression is defined for $x \neq 3$, the expression can be rewritten as $x+1-\frac{2}{x-3}$.

Long division can also be used as an alternate approach. Choices A, B, and C are incorrect and may result from errors made when dividing the two polynomials or making use of structure.

Question Difficulty: Hard

Question ID 911c415b

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: 911c415b

$$(7532+100y^2)+10(10y^2-110)$$

The expression above can be written in the form ay^2+b, where a and b are constants. What is the value of $a+b$?

ID: 911c415b Answer

Rationale

The correct answer is 6632. Applying the distributive property to the expression yields $(7532+100y^2)+(100y^2-1100)$. Then adding together $7532+100y^2$ and $100y^2-1100$ and collecting like terms results in $200y^2+6432$. This is written in the form ay^2+b, where $a=200$ and $b=6432$. Therefore $a+b=200+6432=6632$.

Question Difficulty: Hard

Question ID b74f2feb

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: b74f2feb

The expression $6\sqrt[5]{3^5x^{45}} \cdot \sqrt[8]{2^8x}$ is equivalent to ax^b, where a and b are positive constants and $x > 1$. What is the value of $a + b$?

ID: b74f2feb Answer

Correct Answer: 361/8, 45.12, 45.13

Rationale

The correct answer is $\frac{361}{8}$. The rational exponent property is $\sqrt[n]{y^m} = y^{\frac{m}{n}}$, where $y > 0$, m and n are integers, and $n > 0$. This property can be applied to rewrite the given expression $6\sqrt[5]{3^5x^{45}} \cdot \sqrt[8]{2^8x}$ as $63^{\frac{5}{5}}x^{\frac{45}{5}}2^{\frac{8}{8}}x^{\frac{1}{8}}$, or $63x^92x^{\frac{1}{8}}$. This expression can be rewritten by multiplying the constants, which gives $36x^9x^{\frac{1}{8}}$. The multiplication exponent property is $y^n \cdot y^m = y^{n+m}$, where $y > 0$. This property can be applied to rewrite the expression $36x^9x^{\frac{1}{8}}$ as $36x^{9+\frac{1}{8}}$, or $36x^{\frac{73}{8}}$. Therefore, $6\sqrt[5]{3^5x^{45}} \cdot \sqrt[8]{2^8x} = 36x^{\frac{73}{8}}$. It's given that $6\sqrt[5]{3^5x^{45}} \cdot \sqrt[8]{2^8x}$ is equivalent to ax^b; therefore, $a = 36$ and $b = \frac{73}{8}$. It follows that $a + b = 36 + \frac{73}{8}$. Finding a common denominator on the right-hand side of this equation gives $a + b = \frac{288}{8} + \frac{73}{8}$, or $a + b = \frac{361}{8}$. Note that 361/8, 45.12, and 45.13 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID f89e1d6f

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: f89e1d6f

If $a = c + d$, which of the following is equivalent to the expression $x^2 - c^2 - 2cd - d^2$?

A. $(x+a)^2$

B. $(x-a)^2$

C. $(x+a)(x-a)$

D. $x^2 - ax - a^2$

ID: f89e1d6f Answer

Correct Answer: C

Rationale

Choice C is correct. Factoring −1 from the second, third, and fourth terms gives $x^2 - c^2 - 2cd - d^2 = x^2 - (c^2 + 2cd + d^2)$. The expression $c^2 + 2cd + d^2$ is the expanded form of a perfect square: $c^2 + 2cd + d^2 = (c + d)^2$. Therefore, $x^2 - (c^2 + 2cd + d^2) = x^2 - (c + d)^2$. Since $a = c + d$, $x^2 - (c + d)^2 = x^2 - a^2$. Finally, because $x^2 - a^2$ is the difference of squares, it can be expanded as $x^2 - a^2 = (x + a)(x - a)$.

Choices A and B are incorrect and may be the result of making an error in factoring the difference of squares $x^2 - a^2$. Choice D is incorrect and may be the result of incorrectly combining terms.

Question Difficulty: Hard

Question ID e117d3b8

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Equivalent expressions	■■■

ID: e117d3b8

If a and c are positive numbers, which of the following is equivalent to $\sqrt{(a+c)^3} \cdot \sqrt{a+c}$?

A. $a+c$

B. a^2+c^2

C. $a^2+2ac+c^2$

D. a^2c^2

ID: e117d3b8 Answer

Correct Answer: C

Rationale

Choice C is correct. Using the property that $\sqrt{x}\sqrt{y}=\sqrt{xy}$ for positive numbers x and y, with x = $(a + c)^3$ and y = a + c, it follows that $\sqrt{(a+c)^3} \cdot \sqrt{a+c}=\sqrt{(a+c)^4}$. By rewriting $(a + c)^4$ as $((a + c)^2)^2$, it is possible to simplify the square root expression as follows: $\sqrt{((a+c)^2)^2}=(a+c)^2=a^2+2ac+c^2$.

Choice A is incorrect and may be the result of $\sqrt{(a+c)^3} \div \sqrt{(a+c)}$. Choice B is incorrect and may be the result of incorrectly rewriting $(a + c)^2$ as $a^2 + c^2$. Choice D is incorrect and may be the result of incorrectly applying properties of exponents.

Question Difficulty: Hard