# Question ID 371cbf6b

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

**ID: 371cbf6b**

3.1

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

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

3.2

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

3.3

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

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

3.4

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

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 $(70n)^{\frac{1}{5}}\left((70n)^{\frac{1}{6}}\right)^2$. 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 $\sqrt[5]{70n}\left(\sqrt[6]{70n}\right)^2$ 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**

3.5

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 $(3x-23)(19x+6)$ is equivalent to the expression $ax^2+bx+c$, where $a$, $b$, and $c$ are constants. Applying the distributive property to the given expression, $(3x-23)(19x+6)$, yields $(3x)(19x)+(3x)(6)-(23)(19x)-(23)(6)$, 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

3.6

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

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

3.7

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

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 $a\left(4x^2 + 7x + 13\right)$. Applying the distributive property to the expression $a\left(4x^2 + 7x + 13\right)$ 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**

3.8

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**

3.9

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**

3.10

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

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

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 | Math | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Equivalent expressions | ■■■ |

**ID: a0b4103e**

3.11

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

3.12

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 12e7faf8

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

**ID: 12e7faf8**

3.13

The equation $\frac{x^2+6x-7}{x+7}=ax+d$ 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 $\frac{(x+7)(x-1)}{x+7}=ax+d$. Since $x \neq -7$, $x+7$ is also not equal to 0, so both the numerator and denominator of $\frac{(x+7)(x-1)}{x+7}$ 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**

3.14

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

3.15

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

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 f89e1d6f

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

**ID: f89e1d6f**

3.16

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**

3.17

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

# Question ID c6e85cd7

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

**ID: c6e85cd7**

3.18

If $4^{8c} = \sqrt[3]{4^7}$, what is the value of $c$?

**ID: c6e85cd7 Answer**

**Correct Answer:** .2916, .2917, 7/24

**Rationale**

The correct answer is $\frac{7}{24}$. An expression of the form $\sqrt[n]{a^m}$ , where $m$ and $n$ are integers greater than $1$ and $a \geq 0$, is equivalent to $a^{\frac{m}{n}}$. Therefore, the expression on the right-hand side of the given equation, $\sqrt[3]{4^7}$ , is equivalent to $4^{\frac{7}{3}}$. Thus, $4^{8c} = 4^{\frac{7}{3}}$. It follows that $8c = \frac{7}{3}$. Dividing both sides of this equation by $8$ yields $c = \frac{7}{24}$. Note that 7/24, .2916, .2917, 0.219, and 0.292 are examples of ways to enter a correct answer.

**Question Difficulty:** Hard