

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

4 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

ลองแทน $x = 2$

$$5a = 20$$

$$a = 4$$

$$-4b + 15 = -9$$

$$b = 6$$

$$ab = 6(4)$$

$$= 24 //$$

แทนค่าห้ามเกิด

Undefined.

และต้องตามเงื่อนไขของโจทย์ด้วย

3.1

Question ID 40c09d66

Assessment	Test	Domain	Skill	Difficulty
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ID: 40c09d66

3.2

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

$$x^{\frac{5}{2} - \frac{4}{3}} = x^{\frac{a}{b}}$$
$$\frac{7}{6} = \frac{a}{b}$$
$$//$$

Question ID 34847f8a

Assessment	Test	Domain	Skill	Difficulty
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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

$$\begin{aligned} \underline{2}(x+5) + \underline{3}(x-2) &= \underline{r}x + \underline{t} \\ r &= 5 \\ t &= 2(5) + 3(-2) \\ &= 4 \\ rt &= 5(4) \\ &= 20 // \end{aligned}$$

Question ID 137cc6fd

Assessment	Test	Domain	Skill	Difficulty
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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 $n > 1$?

$$A^{\frac{1}{5}} \left(A^{\frac{1}{6}} \right)^2 = A^{30X}$$

$$\frac{1}{5} + \frac{2}{6} = 30X$$

$$X = \frac{4}{225} //$$

Question ID ea6d05bb

Assessment	Test	Domain	Skill	Difficulty
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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 ?

$$(19ax^2 + 19bx + 6ax + 6bx) + (19a \times 6)$$

$$-23(19) + 6(3) = -419 //$$

Question ID d8789a4c

Assessment	Test	Domain	Skill	Difficulty
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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

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

$$x^2 - c = x^2 - b^2$$

$$c = b^2$$

$$b = 1 \rightarrow c = 1$$

$$b = 2 \rightarrow c = 4 //$$

Question ID 5355c0ef

Assessment	Test	Domain	Skill	Difficulty
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ID: 5355c0ef

3.7

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

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

$$\begin{array}{r}
 4a = 0.36 \\
 a = 0.09 \quad // \\
 \hline
 7a = 0.63 \\
 a = 0.09 \quad // \\
 \hline
 13a = 1.17 \\
 a = 0.09 \quad //
 \end{array}$$

Question ID c81b6c57

Assessment	Test	Domain	Skill	Difficulty
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ID: c81b6c57

3.8

In the expression $\underline{3}(2x^2 + \underline{px} + 8) - \underline{16x}(p + 4)$, 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

$$\begin{aligned}
 3p - 16p + (-64) &= -155 \\
 -13p - 64 &= -155 \\
 p &= 7 //
 \end{aligned}$$

Question ID 2c88af4d

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ID: 2c88af4d

3.9

$$\frac{x^{-2}y^{\frac{1}{2}}}{x^{\frac{1}{3}}y^{-1}}$$

The expression $x^{\frac{1}{3}}y^{-1}$, 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. ~~$\frac{y\sqrt{y}}{x\sqrt{x}}$~~

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

เลือกเวลา

$$= x^{-2-\frac{1}{3}} y^{\frac{1}{2}+1} = \frac{y\sqrt{y}}{x^2\sqrt[3]{x}} //$$

ลองแทนค่า $x=2, y=3$

ใช้

Question ID 22fd3e1f

Assessment	Test	Domain	Skill	Difficulty
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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. $\frac{x(x-3)}{x+1}$

☒ $\frac{x(x+3)}{x+1}$

$$\text{Answer } x = 4$$

$$\frac{x(x-3)(x+3)}{(x-3)(x+1)} = \frac{x(x+3)}{x+1} //$$

Question ID a0b4103e

Assessment	Test	Domain	Skill	Difficulty
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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. $\sqrt{6}$~~

$$\frac{1}{3}x^2 - 2 = \frac{1}{3}(x^2 - k^2) \quad 3.11$$

$$\frac{1}{3}x^2 - 2 = \frac{1}{3}x^2 - \frac{k^2}{3}$$

$$-2 = -\frac{k^2}{3}$$

$$k^2 = 6$$

$$k = \sqrt{6}, -\sqrt{6}$$

~~$$x^2 - 2 = (x-k)(x+k)$$

$$x^2 - \sqrt{2}^2 = (x - \sqrt{2})(x + \sqrt{2})$$

$$k = \sqrt{2}, -\sqrt{2}$$~~

~~$$x^2 - 2 = x^2 - k^2$$

$$2 = k^2$$

$$k = \sqrt{2}, -\sqrt{2}$$~~

Question ID ad038c19

Assessment	Test	Domain	Skill	Difficulty
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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. $a^2 + ab + \frac{b^2}{4}$~~

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

Question ID 12e7faf8

Assessment	Test	Domain	Skill	Difficulty
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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

$$\begin{aligned} &\text{Let } x = 1 \text{ (check)} \\ &\hline &(\cancel{x+7})(x-1) = ax+d \\ &\hline &\cancel{x+7} \\ &\quad x-1 = ax+d \\ &\quad a = 1, d = -1 \\ &\quad a+d = 1+(-1) \\ &\quad = 0 // \end{aligned}$$

Question ID 89fc23af

Assessment	Test	Domain	Skill	Difficulty
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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. $x + 1 - \frac{2}{x - 3}$

~~$x + 1 - \frac{2}{x - 3}$~~

แทน $x = 4$ ใจว่า

หารพหุคูณ

$$\begin{array}{r}
 x + 1 \\
 x - 3 \overline{) x^2 - 2x - 5} \\
 \underline{x^2 - 3x} \\
 x - 5 \\
 \underline{x - 3} \\
 -2
 \end{array}$$

Question ID 911c415b

Assessment	Test	Domain	Skill	Difficulty
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ID: 911c415b

3.15

$$\underbrace{(7532 + 100y^2)} + 10(\underbrace{10y^2 - 110})$$

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

$$\begin{aligned} a &= 100 + 10(10) \\ &= 200 \\ b &= 7,532 + 10(-110) \\ &= 6,432 \\ a + b &= 200 + 6,432 \\ &= 6,632 // \end{aligned}$$

Question ID f89e1d6f

Assessment	Test	Domain	Skill	Difficulty
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ID: f89e1d6f

3.16

If $a = \underline{c+d}$, 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. $x^2 - ax - a^2$

$$\begin{aligned}
 &= x^2 - (c^2 + 2cd + d^2) \\
 &= x^2 - (\underline{c+d})^2 \\
 &= x^2 - a^2 \\
 &= (x-a)(x+a) //
 \end{aligned}$$

Question ID e117d3b8

Assessment	Test	Domain	Skill	Difficulty
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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

แทน $a = 2$ $c = 3$

$$A^{\frac{3}{2}} \times A^{\frac{1}{2}} = A^2$$

$$= (a+c)^2$$

$$= a^2 + 2ac + c^2 //$$

แทนค่า
พิสูจน์ได้
แล้ว

Question ID c6e85cd7

Assessment	Test	Domain	Skill	Difficulty
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ID: c6e85cd7

3.18

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

$$8C = \frac{7}{3}$$
$$C = \frac{7}{24} //$$