

#1

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

#2

ID: c3b116d7

Which of the following expressions is(are) a factor of $3x^2 + 20x - 63$?

- I. $x - 9$
- II. $3x - 7$

- A) I only
- B) II only
- C) I and II
- D) Neither I nor II

#3

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 $\frac{a}{b}$?

#4

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

#5

ID: 137cc6fd

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

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

#6

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 ?

#7

ID: 433184f1

Which expression is equivalent to $\frac{4}{4x-5} - \frac{1}{x+1}$?

- A) $\frac{1}{(x+1)(4x-5)}$
 B) $\frac{3}{3x-6}$
 C) $-\frac{1}{(x+1)(4x-5)}$
 D) $\frac{9}{(x+1)(4x-5)}$

#8

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

#9

ID: 5355c0ef

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

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

#10

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

#11

ID: 967ef685

Which expression is equivalent to $\frac{42a}{k} + 42ak$, where $k > 0$?

- A) $\frac{84a}{k}$
 B) $\frac{84ak^2}{k}$
 C) $\frac{42a(k+1)}{k}$
 D) $\frac{42a(k^2 + 1)}{k}$

#12

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

#13

ID: ffdbcad4

The expression $4x^2 + bx - 45$, where b is a constant, can be rewritten as $(hx + k)(x + j)$, where h , k , and j are integer constants. Which of the following must be an integer?

- A) $\frac{b}{h}$
- B) $\frac{b}{k}$
- C) $\frac{45}{h}$
- D) $\frac{45}{k}$

#14

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

#15

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) $\sqrt{6}$

#16

ID: c6e85cd7

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

#17

ID: ad038c19

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

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

#18

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

#19

ID: 42f8e4b4

One of the factors of $2x^3 + 42x^2 + 208x$ is $x + b$, where b is a positive constant. What is the smallest possible value of b ?

#20

ID: 12e7faf8

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

#21

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

#22

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 $a + b$?

#23

ID: b74f2feb

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

#24

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) $x^2 - ax - a^2$

#25

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) $a^2 c^2$

#26

ID: 7355b9d9

If $k - x$ is a factor of the expression $-x^2 + \frac{1}{29}nk^2$, where n and k are constants and $k > 0$, what is the value of n ?

- A) -29
- B) $-\frac{1}{29}$
- C) $\frac{1}{29}$
- D) 29