#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: e51bf5b1

Which of the following expressions has a factor of $x + 2b$, where b is a positive integer constant?

A) $3x^2 + 7x + 14b$

B) $3x^2 + 28x + 14b$

C) $3x^2 + 42x + 14b$

D) $3x^2 + 49x + 14b$

#12

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) $\frac{42a(k^2+1)}{k}$

#13

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

#14

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) $\frac{45}{k}$

#15

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

#16

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) $\sqrt{6}$

#17

ID: c6e85cd7

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

#18

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

#19

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

#20

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 ?

#21

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

#22

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

#23

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 $a+b$?

#24

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 $a + b$?

#25

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

#26

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

#27

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