

Simplify $\frac{n^2 - 16}{n^2 + n - 20}$

$$\frac{\cancel{(n-4)}(n+4)}{\cancel{(n-4)}(n+5)} \quad [n \neq 4]$$

$$n+1 + \frac{-6}{n+4} \quad \text{or} \quad n+1 - \frac{6}{n+4}$$

$$\begin{array}{r}
 n+4 \overline{)n^2 + 5n - 2} \\
 \underline{-n^2 + 4n} \\
 n - 2 \\
 \underline{-n + 4} \\
 -6
 \end{array}$$

$$\left(\frac{n^2 y^{-2}}{a^{-4}}\right)^2 = \left(\frac{n^2 a^4}{y^2}\right)^2$$

$$\frac{n^2 a^4}{y^2} \cdot \frac{n^2 a^4}{y^2} = \frac{n^4 a^8}{y^4}$$

Factor $(3n^3 + 12n^2 + 2n + 8)$

$$\begin{array}{l}
 \underline{3n^2}(n+4) + \underline{2}(n+4) \\
 (n+4)(3n^2 + 2)
 \end{array}$$

If $f(x) = 3x - 10$ and $g(x) = 2x + 1$, what is $f(g(x))$?

$$\begin{array}{l}
 \uparrow \\
 f(2x+1) = 3(2x+1) - 10 \\
 6x + 3 - 10 \\
 6x - 7
 \end{array}$$

What is the distance from (-3,-2) to (1,-6)?

- A. $4\sqrt{2}$
- B. $3\sqrt{2}$
- C. $2\sqrt{3}$
- D. $2\sqrt{2}$

$$D = \sqrt{\Delta x^2 + \Delta y^2}$$
$$\sqrt{4^2 + 4^2}$$
$$\sqrt{32} = \sqrt{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}$$
$$4\sqrt{2}$$

What is the inverse of $f(x) = 3x - 5$?

$$y = 3x - 5$$
$$x = 3y - 5$$
$$\begin{array}{r} x = 3y - 5 \\ +5 \quad +5 \\ \hline x + 5 = 3y \end{array}$$

Which is the equation that is parallel to $y = 5x - 2$ and goes through (1, 1)?

- A. $5x - y = 4$
- B. $5x - 2y = 3$
- C. $5x + y = 6$
- D. $-5x - y = -6$

$$y - y_1 = m(x - x_1)$$
$$y - 1 = 5(x - 1)$$
$$\begin{array}{r} y - 1 = 5x - 5 \\ +1 \quad +1 \\ \hline y = 5x - 4 \end{array}$$
$$\begin{array}{r} -5x \quad -5x \\ \hline -1[5x + y = -4] \end{array}$$
$$5x - y = 4$$

$$\begin{cases} y = 3x - 1 \\ y + x = 15 \end{cases}$$

$$3x - 1 + x = 15$$

$$4x - 1 = 15$$

$$x = 4 \quad \therefore y = 11$$

What is the distance from $(2, n)$ to $(4, n + 2)$?

$$D = \sqrt{\Delta x^2 + \Delta y^2} \quad n - (n + 2)$$

$$\sqrt{2^2 + 2^2}$$

$$\sqrt{8} = 2\sqrt{2}$$

Factor $5a^2 + 10a^3$

$$5a^2(1 + 2a)$$

Find the equation of the line, in slope intercept form, that goes through the point $(2, -1)$ and $(3, -5)$

$$y - y_1 = m(x - x_1)$$

$$y + 1 = -4(x - 2) \quad m = \frac{\Delta y}{\Delta x} = \frac{-5 - (-1)}{3 - 2}$$

$$y + 1 = -4x + 8$$

$$\begin{array}{r} y + 1 = -4x + 8 \\ \underline{-1} \quad \quad \underline{-1} \\ y = -4x + 7 \end{array} \quad \begin{array}{r} -4 \\ \underline{-1} \\ -4 \end{array}$$

How many different ways can one answer a 10 question multiple choice test that has options A, B, C, and D?

$$\frac{215!}{213!} = \frac{215 \cdot 214 \cdot \cancel{213} \cdot \dots \cdot \cancel{2} \cdot 1}{\cancel{213} \cdot \cancel{212} \cdot \dots \cdot \cancel{2} \cdot 1}$$

$$= 46,010$$

$$\begin{bmatrix} 2 & 3 \\ 2 & 4 \end{bmatrix} \cdot \begin{bmatrix} 3 & -2 \\ -1 & -4 \end{bmatrix}$$

$$\begin{bmatrix} 6 + -3 & -4 - 12 \\ 6 + -4 & -4 - 16 \end{bmatrix} = \begin{bmatrix} 3 & -16 \\ 2 & -20 \end{bmatrix}$$

$$\begin{bmatrix} 2 & 3 \\ 5 & 9 \end{bmatrix} \cdot \begin{bmatrix} 2 & 3 \\ 2 & 4 \end{bmatrix}$$

$$\text{Simplify } \frac{n^2 - 16}{n^2 + n - 20} = \frac{\cancel{(n-4)}(n+4)}{\cancel{(n-4)}(n+5)}$$

$$\frac{n+4}{n+5} \quad [n \neq 4]$$

$$\begin{array}{r}
 n+4 \overline{)n^2 + 5n - 2} \\
 \underline{-n^2 + 4n} \\
 n - 2 \\
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 -6
 \end{array}$$

$$\left(\frac{n^2 y^{-2}}{a^{-4}} \right)^2 = \left(\frac{n^2 a^4}{y^2} \right)^2$$

$$\frac{n^2 a^4}{y^2} \cdot \frac{n^2 a^4}{y^2} = \frac{n^4 a^8}{y^4}$$

$$\begin{aligned}
 \text{Factor } & (3n^3 + 12n^2) + (2n + 8) \\
 & 3n^2(n+4) + 2(n+4) \\
 & (n+4)(3n^2 + 2)
 \end{aligned}$$

If $f(x) = 3x - 10$ and $g(x) = 2x + 1$, what is $f(g(x))$?

$$\begin{aligned}
 f(\overbrace{2x+1}^{\swarrow}) &= 3(2x+1) - 10 \\
 &= 6x + 3 - 10 \\
 &= 6x - 7
 \end{aligned}$$

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- D. $2\sqrt{2}$

$$\begin{aligned} D &= \sqrt{\Delta x^2 + \Delta y^2} \\ &= \sqrt{4^2 + 4^2} \\ \sqrt{32} &= \sqrt{\cancel{2} \cdot \cancel{2} \cdot 2 \cdot 2} \\ &= 4\sqrt{2} \end{aligned}$$

What is the inverse of $f(x) = 3x - 5$?

$$\begin{aligned} y &= 3x - 5 \\ x &= 3y - 5 \\ \hline x + 5 &= 3y \\ \hline x + 5 &= 3y \end{aligned}$$

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$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - 1 &= 5(x - 1) \\ y - 1 &= 5x - 5 \\ \hline y &= 5x - 4 \\ \hline -5x + y &= -4 \\ \hline 5x - y &= 4 \end{aligned}$$

$$\begin{cases} y = 3x - 1 \\ y + x = 15 \end{cases}$$

$$3x - 1 + x = 15$$

$$4x - 1 = 15$$

$$x = 4 \quad \therefore y = 11$$

What is the distance from $(2, n)$ to $(4, n + 2)$?

$$\begin{aligned} D &= \sqrt{\Delta x^2 + \Delta y^2} && n - (n + 2) \\ &= \sqrt{2^2 + 2^2} \\ &= \sqrt{8} \end{aligned}$$

Factor $5a^2 + 10a^3$

$$5a^2(1 + 2a)$$

Find the equation of the line, in slope intercept form, that goes through the point $(2, -1)$ and $(3, -5)$

$$\begin{aligned} y - y_1 &= m(x - x_1) && m = \frac{\Delta y}{\Delta x} = \frac{-1 - (-5)}{2 - 3} \\ y - (-1) &= -4(x - 2) && \frac{4}{-1} \\ y + 1 &= -4x + 8 && -4 \\ \underline{-1} & && \\ y &= -4x + 7 \end{aligned}$$

How many different ways can one answer a 10 question multiple choice test that has options A, B, C, and D?

$$\frac{215!}{213!} = \frac{215 \cdot 214 \cdot 213 \cdots 2 \cdot 1}{\cancel{213 \cdots 2 \cdot 1}}$$

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$$\begin{bmatrix} 2 & 3 \\ 2 & 4 \end{bmatrix} \cdot \begin{bmatrix} 3 & -2 \\ -1 & -4 \end{bmatrix}$$

$$\begin{bmatrix} 6-3 & -4-12 \\ 6-4 & -4-16 \end{bmatrix} = \begin{bmatrix} 3 & -16 \\ 2 & -20 \end{bmatrix}$$

$$\begin{bmatrix} 2 & 3 \\ 5 & 9 \end{bmatrix} \cdot \begin{bmatrix} 2 & 3 \\ 2 & 4 \end{bmatrix}$$