SSAT 数学硬骨头 IV

Question

In the xy-coordinate plane, the point $(-5, 8)$ is shifted **7 units to the left**, **3 units up**, and then **reflected over the x-axis**. What will be the new coordinates of the point?

Options:

A) $(-12, -11)$
B) $(-12, 5)$
C) $(-5, -11)$
D) $(-12, -5)$
E) $(-8, -11)$

Question

Approximate Distances

Object	Distance (in kilometers)
Earth to Venus	41×10^6
Earth to Jupiter	778×10^6

Based on the table above, the distance from Earth to Jupiter is approximately how many times the distance from Earth to Venus?

Options:

A) 15
B) 18
C) 20
D) 25
E) 30

Question

Simplify the following expression:

$$\left(j^{-2}k^{3}m^{-4}\right)^{-2}\cdot\frac{k^{-1}m^{3}}{j^{4}}$$

Options:

A) $\frac{j^{8}m^{5}}{k^{7}}$
B) $\frac{j^{12}m^{5}}{k^{5}}$
C) $\frac{k^{5}}{j^{12}m^{5}}$
D) $\frac{k^{7}}{j^{8}m^{5}}$
E) $\frac{j^{8}}{k^{5}m^{5}}$

Question

Which of the following is equivalent to:

$$\frac{x+3}{5}-\left(\frac{2x-1}{4}+\frac{x-2}{10}\right)?$$

Options:

A) $-\frac{13x+17}{20}$
B) $-\frac{3x+13}{20}$
C) $-\frac{13x-11}{20}$
D) $-\frac{7x+9}{20}$
E) $-\frac{11x-17}{20}$

Simplify the following expression:

$$\sqrt{(3^{4}+2^{3})^{2}}-\left(2^{5-2}\cdot\sqrt{4^{3}}\right)$$

Simplify the following expression:

$$\sqrt{(2^{4}+3^{2})\cdot\sqrt{3^{3}+2^{5}}}-\frac{(2^{3})^{2}}{\sqrt{4^{4}}}$$

Scenario-Based Question

A power station is testing two energy reactors:

1. **Reactor A** generates 3^2 units of energy every second and runs for 4 seconds.
2. **Reactor B** generates energy based on the formula $\sqrt{4^2 + 2^4}$ units per second and runs for 3 seconds.

At the end of the test:

1. **The total energy** from both reactors is multiplied by $\sqrt{2^4}$ to compute the "efficiency score."
2. Finally, $\frac{(2^3)^2}{\sqrt{4^2}}$ is added to the efficiency score to find the **final energy output**.

Question:

What is the final energy output? Simplify your answer to a single integer.