Chapter 8 Gifted and Enrichment Answers

1. The square root sign around a value means the number when multiplied by itself is equal to the value. Since any number multiplied by itself is always positive, a square root sign around a negative number has no meaning.

2. It is possible that some temperatures can be recorded as positive integers and as negative integers because of how the zero point is defined in each scale.
In the Celsius scale, the zero point is the freezing point of water, recorded $0^{\circ}C$.
In the Kelvin scale, the zero point is a theoretical point where all atomic motion stops, recorded without a degree symbol, 0 K, and the freezing point of water is 273 K. In the Fahrenheit scale, the zero point is the stabilization point of a brine mixture of ammonium chloride, ice, and water, recorded $0^{\circ}F$, and the freezing point of water is $32^{\circ}F$. So, on a day when ice has formed on puddles, the outside temperature might be $-2^{\circ}C$, 271 K, or $28^{\circ}F$.

3. Consider a pattern such as
$-3 \times 4 = -12$
$-3 \times 3 = -9$
$-3 \times 2 = -6$
$-3 \times 1 = -3$
$-3 \times 0 = 0$
$-3 \times (-1) = 3$
$-3 \times (-2) = 6$
$-3 \times (-3) = 9$
$-3 \times (-4) = 12$
where the product increases by 3, showing that $-3 \times$ any negative integer has a product that a positives integer.

4. The product of two negative integers is positive. Then, that positive integer has a negative integer added to give 50.
The integers being multiplied should have a product greater than 50 so that when a negative integer is added, the sum could be 50.
−8 and −7 are consecutive negative integers with a product of 56. 56 is 6 greater than 50, and −6 is consecutive with −8 and −7.
The three consecutive negative integers are −8, −7, and −6.

5. We don't know if the integers are positive or negative. Using guess and test, try 4, 5, and 6.
$4 + 5 + 6 = 15$
$15 \times 33 = 495$
$4 \times 5 \times 6 = 120$
$495 \neq 120$
Try greater numbers like 7, 8, and 9.
$7 + 8 + 9 = 24$
$24 \times 33 = 792$
$7 \times 8 \times 9 = 504$
$792 \neq 504$
Still not that close; try 9, 10, and 11.
$9 + 10 + 11 = 30$
$30 \times 33 = 990$
$9 \times 10 \times 11 = 990$
$990 = 990$
So, the integers are 9, 10, and 11, their sum is 30, and their product is 990.
But −9, −10, and −11 have a negative sum, so the product of their sum and 33 would be negative, and their product is negative. Check,
$-9 + (-10) + (-11) = -30$
$-30 \times 33 = -990$
$-9 \times (-10) \times (-11) = -990$
$-990 = -990$
So, the integers could also be −9, −10, and −11, their sum is −30, and their product is −990.