

Reading the Structure of Expressions

Grade 9 – Algebra 1 math · Test Answer Key · Standards: A-SSE.A.1a, A-SSE.A.1b, N-RN.B.3

Use this answer key to score the test. Accept equivalent wording in interpretations and any valid example where the question asks for one, but require the correct sign on every coefficient.

Standards: A-SSE.A.1a, A-SSE.A.1b, N-RN.B.3 · **Level:** Grade 9 Algebra 1

Question 1 Parts of an expression (2 points)

Terms: $9y^2$, $-4y$, 11.

Coefficients: 9 and -4 . Constant term: 11.

3 terms; coefficients 9 and -4 ; constant 11

Scoring: 1 point for the three terms, 1 point for the coefficients (including the sign) and the constant.

Question 2 Name the factors (2 points)

Factors: 3, a and $(b + 4)$.

The sum factor is $(b + 4)$.

Scoring: 1 point for the three factors, 1 point for identifying $(b + 4)$.

Question 3 Rational or irrational (2 points)

(a) $\sqrt{81} = 9$, rational. (b) $\sqrt{45} = 3\sqrt{5}$, irrational. (c) $0.375 = \frac{3}{8}$, rational. (d) 3π , a nonzero rational times π , irrational.

(a) rational (b) irrational (c) rational (d) irrational

Scoring: 0.5 point each.

Question 4 Kayak rental (3 points)

(a) 18 is a fixed fee; 9.5 is the charge in dollars per hour.

(b) $18 + 9.5(3.5) = 18 + 33.25 = 51.25$.

(c) The term $9.5h$, which equals \$33.25.

\$51.25

Scoring: 1 point per part.

Question 5 Growth of an investment (3 points)

(a) Starting value \$1,500; growth factor 1.06; rate 6% per year.

(b) $1.06^2 = 1.1236$, so $1,500 \times 1.1236 = \$1,685.40$.

(c) After 1 year: $1,500(1.06) = 1,590$, so growth is \$90.

(b) \$1,685.40 (c) \$90

Scoring: 1 point per part.

Question 6 Sum with a root (2 points)

If $7 + \sqrt{10}$ were rational, subtracting 7 would make $\sqrt{10}$ rational. But $\sqrt{10}$ is irrational, since 10 is not a perfect square.

$7 + \sqrt{10}$ is irrational.

Scoring: 1 point for the answer, 1 point for the justification.

Question 7 Making rational results (2 points)

(a) Example: $\sqrt{5}$ and $-\sqrt{5}$ give a sum of 0. Another valid pair is $2 + \sqrt{3}$ and $4 - \sqrt{3}$, sum 6.

(b) Example: $\sqrt{3}$ and $\sqrt{12}$ give $\sqrt{36} = 6$. Another valid pair is $\sqrt{2}$ and $\sqrt{2}$, product 2.

Any valid pairs with the correct sum or product

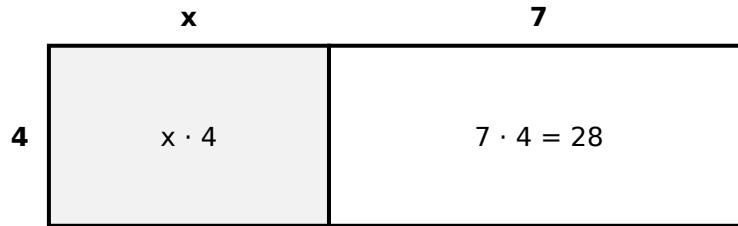
Scoring: 1 point per part; accept any correct example.

Question 8 Rectangle structure (3 points)

(a) $2(x + 7 + 4) = 2x + 22$.

(b) Area = $4(5 + 7) = 48$.

(c) The factor 4 is the width: the area is 4 strips, each of length $x + 7$.



Area $4(x + 7) = 4x + 28$.

(a) $2x + 22$ (b) 48 square units

Scoring: 1 point per part.

Question 9 Area of a circle (1 point)

The area is 25π , a nonzero rational number times π .

Irrational

Scoring: 1 point for the answer with the explanation.