Year 7 substitution worksheet

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Name: _____ Date: _____

Question 1

If a = 6, evaluate 3a + 7.

Answer: _____

Question 2

If a = -3, evaluate 5a + 2.

Answer: _____

Question 3

If x = 4 and y = 9, evaluate 2xy - 5y.

Answer: _____

Question 4

If x = -2 and y = 4, evaluate x^2 - 3y.

Answer: _____

Question 5

If m = 12 and n = 3, evaluate m/n + 4n.

Answer: _____

Question 6

If m = -6 and n = -2, evaluate m/n - mn.

Answer: _____

Question 7

The fare for a taxi trip is given by F = 4 + 2d, where F is the fare in dollars and d is the distance in kilometres.

(a) Find the fare for a 7 km trip.

(b) Find the fare for a 15 km trip.

(c) A trip costs $30. By trying values of d, find how long the trip was.

Answer: _____

Question 8

The formula C = (5(F - 32))/(9) converts a temperature F in degrees Fahrenheit to C in degrees Celsius.

(a) Convert 14°F to degrees Celsius.

(b) Convert -4°F to degrees Celsius.

Answer: _____

Question 9

If p = 7 and q = 2, evaluate $p^2 - 3pq$.

Answer: _____

Question 10

If p = -4 and q = 3, evaluate $2p^2 - pq$.

Answer: _____

Year 7 substitution: answers and worked solutions

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Question 1

Key idea: Replace the pronumeral with its value, then follow the order of operations.

1. 3a + 7 = 3 × 6 + 7 2. = 18 + 7 = 25

Answer: 25

Question 2

Key idea: Substitute using brackets around the negative number, then use the order of operations.

1. 5 × (-3) + 2 2. = -15 + 2 = -13

Answer: -13

Question 3

Key idea: Substitute both values, multiply first, then subtract.

1. 2xy = 2 × 4 × 9 = 72 2. 5y = 5 × 9 = 45 3. 72 - 45 = 27

Answer: 27

Question 4

Key idea: x^2 means x × x; a negative number squared is positive.

1. x^2 = (-2) × (-2) = 4 2. 3y = 3 × 4 = 12 3. 4 - 12 = -8

Answer: -8

Question 5

Key idea: Substitute, then do the division and multiplication before adding.

1. m/n = 12/3 = 4 2. 4n = 4 × 3 = 12 3. 4 + 12 = 16

Answer: 16

Question 6

Key idea: Substitute both values in brackets and apply the sign rules.

1. m/n = -6/-2 = 3 2. mn = (-6) × (-2) = 12 3. 3 - 12 = -9

Answer: -9

Question 7

Key idea: Substitute the distance into the rule. For (c), test values until the fare equals 30.

1. (a) $F = 4 + 2 \times 7 = 4 + 14 = 18$, so \$18 2. (b) $F = 4 + 2 \times 15 = 4 + 30 = 34$, so \$34 3. (c) Try $d = 12$: $4 + 24 = 28$ (too small). Try $d = 13$: $4 + 26 = 30$ ✓

Answer: (a) \$18 (b) \$34 (c) 13 km

Question 8

Key idea: Substitute, work out the bracket first, then multiply and divide.

1. (a) $F - 32 = 14 - 32 = -18$ 2. (a) $C = (5 \times (-18))/(9) = -90/9 = -10$ 3. (b) $F - 32 = -4 - 32 = -36$ 4. (b) $C = (5 \times (-36))/(9) = -180/9 = -20$

Answer: (a) -10°C (b) -20°C

Question 9

Key idea: Replace each pronumeral with its value, then use the order of operations.

1. $p^2 = 49$ 2. $3pq = 3 \times 7 \times 2 = 42$ 3. $49 - 42 = 7$

Answer: 7

Question 10

Key idea: Replace each pronumeral with its value in brackets, then follow the order of operations.

1. $2p^2 = 2 \times (-4)^2 = 2 \times 16 = 32$ 2. $pq = (-4) \times 3 = -12$ 3. $32 - (-12) = 32 + 12 = 44$

Answer: 44