

Spring 05 Algebra Evaluation

MTY Academy

Spring 05-Algebra

1. Solve each of the following problems.

- (1) What number is 12% of 180?
 - (2) What percent of 120 is 42?
 - (3) 25% of what number is 36?
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2. Solve each of the following equations.

- (1) $0.6x + 1.2x = 3x - 2.6$
 - (2) $0.4x + 3.6 = 2.2x + 8.4$
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3. There were 24 students in Math 05-Algebra class last semester. If 30 students are in the same class this semester, what is the percent of increase on the number of students?

4. The original price of an item was \$250. After 25% off the original price, the owner decided to take additional 10% off the markdown price,

- (1) what is the sales price?
 - (2) What is the total discount off the original price?
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5. David bought a pair of shoes at \$39.99. If the sales tax is 8%, how much did he pay for the pair of shoes?

6. Gina gave 15% of her marbles to Christina and 20% to Mary. If she still had 26 marbles left, how many marbles did she have originally?

7. Christina has many candies. She gives 25% of her candies to Gina and then gives two-third of her remaining candies to Lucy. She now has 22 candies left. How many candies does she have originally?

8. The ratio of boys to girls is 3:4. If there are 224 children in a group, how many boys are there in the group?

9. The ratio of the length to the width of a rectangle is 5 : 3 and the length is 56 inches. What is the area of the rectangle?
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10. At a lab, there are 121 rabbits with either white color or brown color (not both). If the ratio of white rabbits to brown rabbits is 3 : 8, how many white rabbits are there at lab?
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11. Hannah has red pens, blue pens, and yellow pens in the ratio of 2 to 7 to 5. If she has 84 pens in all, how many pens of each color does she have?
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12. Gina gave 25% of her marbles to Christina and one-third of the remaining marbles to Mary. If she still had 20 marbles left, how many marbles did she have originally?
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13. Lily plans to spend all of her \$31 to buy different types of pens that cost \$2, \$3 and \$4 respectively. If she wants to buy at least 2 pens of each type, what is the maximum number of pens that she can buy? Show your work in detail.
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14. Solve each of the following equations. Verify your answers. Box your answers.
- (1) $\frac{12}{3x} = \frac{3}{6}$
- (2) $\frac{21}{3n} = \frac{35}{45}$
- (3) $\frac{2}{x-3} = -\frac{3}{x}$
- (4) $\frac{2}{3-x} = \frac{1}{3(x+2)}$
- (5) $\frac{4}{3x-2} = -\frac{8}{2(x-3)}$
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15. The lengths of two strings are in ratio of 7 : 9. If the length of the short string is five less than twice the length of the longer string, how long is each string?

16. John has 30 marbles, 18 of which are red and 12 of which are blue. Jane has 20 marbles, all of them either red or blue. If the ratio of the red marbles to the blue marbles is the same for both John and Jane, then John has how many more blue marbles than Jane?

17. Simplify each of the following square roots. Show your work in detail.

(1) $\sqrt{248}$

(2) $\sqrt{350}$

18. Let a, b, c be lengths of three sides of a right triangle such that $a^2 + b^2 = c^2$. Find each of the missing number.

(1) $a = 5$ and $b = 10$, $c = ?$

(2) $b = 6$ and $c = 9$, $a = ?$

19. Let a, b, c be lengths of three sides of a triangle. Determine whether the triangle is a RIGHT triangle. Give reasons to support your answers.

(1) $a = 21$, $b = 35$, $c = 28$

(2) $a = 6$, $b = 12$, $c = 13$

20. Find the distance between two points, using the distance formula. Simplify your answers. Show your work in detail.

(1) $(-1, -2)$ and $(4, 3)$

(2) $(-2, 1)$ and $(-5, -13)$

21. Find the midpoint of the line segment joining two points, using the midpoint formula. Simplify your answers. Show your work in detail.

(1) $(-1, 5)$ and $(9, 7)$

(2) $\left(\frac{1}{2}, 3\right)$ and $\left(2, -\frac{3}{4}\right)$

22. Given two points $P = (-4, -7)$ and $Q = (a, 3)$, let $M = (-3, -2)$ be the midpoint of the line segment joining P and Q . Find the value of a .

23. Given two points $P = (a, -3)$ and $Q = (4, b)$, let $M = (-3, 5)$ be the midpoint of the line segment joining P and Q . Find the values of a and b .

24. Given three points $A = (1, 2)$, $B = (4, -4)$, and $C = (5, 5)$,
- (1) draw the triangle $\triangle ABC$ by connecting A , B , and C .
 - (2) find the length of each side by using the distance formula.
 - (3) Is the triangle a right triangle? Why?
 - (4) What is the area of the triangle $\triangle ABC$?

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25. Given three points $A = (3, 2)$, $B = (5, -4)$, and $C = (8, 5)$,
- (1) draw the triangle $\triangle ABC$ by connecting A , B , and C .
 - (2) find the length of each side by using the distance formula.
 - (3) Is the triangle a right triangle? Why?
 - (4) What is the area of the triangle $\triangle ABC$?