



Name: _____

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Date: _____ Grade: _____

Basic Math Skills

Diagnostic

Welcome to the Diagnostic for Basic Math Skills. Work every problem that is within your capability. Do not stop if you encounter a problem you can not work. Go on to the next problem until you have completed the entire diagnostic.

Work the following problems and write the answer in the appropriate place.

1.1.
$$\begin{array}{r} 5921 \\ - 64 \\ \hline \end{array}$$

1.2.
$$12 \overline{)145}$$

1.3.
$$\begin{array}{r} 753 \\ \times 47 \\ \hline \end{array}$$

1.4. $423 + 98 + 722 + 3 = \underline{\hspace{2cm}}$

1.5. $2 \text{ km} = \underline{\hspace{2cm}} \text{ m.}$

Number correct for this Section _____

2.1. Multiply the following fractions. $\frac{2}{7} \times \frac{5}{3} \times \frac{2}{5} = \underline{\hspace{2cm}}$

2.2. Divide the following fractions. $\frac{4}{5} \div \frac{2}{5} = \underline{\hspace{2cm}}$

2.3. $50\% = \underline{\hspace{2cm}}$ (fraction).

2.4. Show mathematically: the ratio of four to five. _____



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2.5. $\frac{1}{0} =$ _____

Number correct for this Section _____

3.1. Perform the indicated operation. $10 - 3 - -4 + 21 - +3 =$ _____

3.2. Simplify the following expression. $3 \times 6 \times (-1) \times (2) \times (-2) =$ _____

3.3. Work the following problem. $2\{4 - 4[2(1 + 1) - 10] + 1\} =$ _____

3.3. $x - 3 = 6$ $x =$ _____

3.4. $289^0 =$ _____

3.5. A meeting room in a large building is 40 ft wide and 30 ft long. The area of the room is _____ sq. ft.

Number correct for this Section _____

4.1. The measures of _____ angles add to 180° .
(a) complementary (b) supplementary (c) right

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4.2. Angles whose measures add to 90° are _____ angles.
(a) complementary (b) supplementary (c) obtuse

4.3. $4x + 20 = 2x + 30$ $x =$ _____

4.4. Find the surface area of the following solid.

A rectangular prism: 2 cm wide, 4 cm high, 6 cm deep _____

4.5. Vertical angles are located on _____ sides of intersecting lines.
(a) the same (b) opposite (c) parallel

Number correct for this Section _____

5.1. 25 kilometers is how many miles? _____
(a) 12.42 miles (b) 28.3 miles (c) 10.08 miles (d) 15.525 miles

5.2. $(8.48 \times 10^{-8}) \div (8 \times 10^{-11})$ _____
(a) 1060×10^3 (b) 1.06×10^3 (c) 1.1×10^{-18} (d) $.11 \times 10^{-2}$

5.3. $(45.4 \times 10^5) + (4.4 \times 10^3) =$ _____

5.4. Calculate the interest in the following problem.

$I =$ _____: $P = \$18,000.00$; $r = 3\%$; $t = 6$ months.

5.5. Convert the following number to scientific notation. $98765.43 =$ _____

Number correct for this Section _____



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Use your calculator to work the problems below.

6.1. $800 - 500 + 4 \cdot 35 =$ _____

6.2. $57^3 =$ _____

6.3. $(2.2 \times 10^{11}) + (2.111 \times 10^{13}) =$ _____

6.4. $50^{\circ}C =$ _____ $^{\circ}F$

6.5. $40.5x - 9 = 13.5x + 18$; $x =$ _____

Number correct for this Section _____

7.1. A bag contains 6 blue, 5 red, and 4 white marbles. Calculate the probability of pulling a red marble from the bag. _____

7.2. If an event will occur 100% of the time, the probability is _____.
(a) 100 (b) 1 (c) zero (d) none of these

7.3. The volume of cube A is one cubic unit. Calculate the dimensions of cube B, if the volume of cube B is 27, cubic units. _____





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7.4. Write the value of the Roman numeral: DCCLXXVII = _____

7.5. A number cube of eight sides is specially labeled with the numbers 2, 3, 3, 3, 3, 4, 4. Calculate the odds of rolling a 3. _____

Number correct for this Section _____

8.1. Calculate the area of a rectangle with a length of 7 meters and a width of 5 meters.

- _____ (a) 35 meters (b) 35 sq meters (c) 12 meters (d) 29 sq meters

8.2. Simplify the following mathematical expression.

$$5x + 2x^2 + 4x^3 + 2x^2 + 9x + 5x^3 \text{ _____}$$

8.3. $3x^2 + 2\{2[3(x + 2)] + 2x^2\} + 3 = \text{_____}$

8.4. $\frac{a}{b} \div \frac{d}{c} = \text{_____}$

8.5. $\frac{2x+3y}{5} + \frac{2x+3y}{5} = \text{_____}$

Number correct for this Section _____



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- 9.1. Calculate the circumference of a circle with a radius of 6. (Use a calculator to determine the answer.) _____
- 9.2. A square prism is 4 inches wide, 3 inches high, and 7 inches long. Calculate the volume of the prism. _____
- 9.3. A \$20,000.00 loan at a bank is paid off in 6 months. The simple interest rate is 10%. Calculate the interest owed at the end of six months. _____
- 9.4. Calculate the area of a triangle with a base of length 20 cm and a height of 15 cm.

- 9.5. In the 1936 Olympics, Jesse Owens also won a gold medal in the 100m run. Calculate how many kilometers Jesse ran. _____

Number correct for this Section _____

10.1 $\frac{8(19-16)+15}{13\sqrt{11}} =$ _____

10.2 $\frac{-4x}{4[2(9-8)]} \geq \frac{5(6-2)}{2(14-4)}$ $x =$ _____

- 10.3. Solve the following combined inequality. Express the solution in set-builder and interval notation on the blank.

$55 \leq 5x + 20 \leq 95$ _____

10.4. $4 |17 - 13| - 5 =$ _____

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10.5. Determine the coordinates of the midpoint of the line segment between the points in each problem below.

(20, 42), (40, 6) _____

Number correct for this Section _____

Simplify the following algebraic expressions.

11.1. $(7a + 6b - 5c) + (2a - 3b + 9c) =$ _____

11.2. $\frac{2[2(x-1)+3]}{3[3(x-2)+4]} =$ _____

11.3. $(25x - 10y - 17) - (15x - 5y - 18) =$ _____

11.4. $5(3x + 4)$ _____

11.5. $(8x^3 + 4x^2 + 3x - 1) - (6x^3 + 2x^2 - 2x + 1) =$ _____

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Multiply the following polynomials.

12.1. $(3x + 2)(2x + 1) =$ _____

12.2. $(3x + 1)(2a + 3b + 1) =$ _____



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12.3. $(25x^3 + 15x^2 + 5x) \div (5x) =$ _____

Simplify the following algebraic expressions containing a complex fraction.

12.4. $\frac{\frac{3(x-1)}{2(x+2)}}{\frac{2(x+1)}{7(x+2)}} =$ _____

Factor completely the following expression.

12.5. $15x^2y + 30xy + 30y$ _____

Number correct for this Section _____

