

SUMMER MATH PACKET FOR STUDENTS RISING TO ALGEBRA 2

Provided by COX MATH TUTORING

Directions: Complete the following problems without the use of a calculator, unless the problem

is accompanied by a calculator icon: .

1. Evaluate each expression.

$$1.1. \quad \frac{1-4+-6+-1}{-5} = 2$$

$$1.2. \quad 5 - (-5) + |-8 \times 9| = 81$$

$$1.3. \quad \frac{9 \times 2}{7 \times 2 - 5} = 2$$

$$1.4. \quad -2 - \frac{5 \times 2}{|10|} = -3$$

$$1.5. \quad \frac{1}{8} - \left(\frac{-12}{7}\right) = \frac{103}{56} = 1 \frac{47}{56}$$

$$1.6. \quad 5 - \left(-\frac{3}{5}\right) = \frac{28}{5}$$

$$1.7. \quad 2 - \frac{1}{2} = \frac{3}{2}$$

$$1.8. \quad -1\frac{1}{2} + \frac{3}{7} = -\frac{15}{14} \text{ OR } -1\frac{1}{14}$$

2. Find each product.

$$2.1. \quad \left(-2\frac{3}{10}\right)\left(\frac{1}{2}\right) = -\frac{23}{20}$$

$$2.3. \quad \left(\frac{8}{7}\right)\left(\frac{-2}{5}\right) = -\frac{16}{35}$$

$$2.2. \quad \left(\frac{2}{3}\right)\left(\frac{-3}{2}\right) = -1$$

$$2.4. \quad \left(4\frac{2}{7}\right)\left(-\frac{14}{9}\right) = -\frac{578}{63}$$

3. Find each quotient.

$$3.1. \quad \frac{\frac{-9}{5}}{\frac{7}{5}} = -\frac{9}{7}$$

$$3.3. \quad \frac{1}{4} \div (-2) = -\frac{1}{8}$$

$$3.2. \quad \frac{\frac{1}{5}}{4\frac{5}{7}} = \frac{7}{165}$$

$$3.4. \quad -2\frac{1}{4} \div \frac{-3}{5} = \frac{15}{4}$$

4. Solve each equation.

4.1. $61 = -9 - 5n$

$$n = -14$$

4.2. $-4 = \frac{p-1}{4}$

$$p = -15$$

4.3. $\frac{-481}{36} = \frac{1}{4} - \frac{7}{4}r$

$$r = \frac{70}{9}$$

4.4. $-2\left(x + \frac{5}{3}\right) = -\frac{49}{12}$

$$x = \frac{3}{8}$$

4.5. $-108 = -3(4v + 4)$

$$v = 8$$

4.6. $-7(7x + 7) = -392$

$$x = 7$$

4.7. $5x + 8 = -8 + x$

$$x = -4$$

4.8. $b + 1 = 3 + 2b + 7 - 4b$

$$b = 3$$

4.9. $36 + 7n = -2(7n - 1) + 4n$

$$n = -2$$

4.10. $-(3x - 4) = -24 - 7x$

$$x = -7$$

5. Solve each inequality.

5.1. $1 > 2 + \frac{m}{6}$

$$m < -6$$

5.2. $\frac{b-2}{22} \leq 1$

$$b \leq 24$$

6. Find the slope of the line through each pair of points.

6.1. $(3, -12), (18, -12)$

$$m = \frac{-12 - (-12)}{18 - 3} = \frac{0}{15} = 0$$

6.2. $(-14, 19), (-19, -18)$

$$m = \frac{19 - (-18)}{-14 - (-19)} = \frac{37}{5}$$

7. Write the slope-intercept form of the equation of the line through the given point with the given slope.

7.1. through $(-1, 2)$, slope = -3

$$y = -3x - 1$$

7.2. through $(-1, -5)$, slope = 8

$$y = 8x + 3$$

8. Write the slope-intercept form of the equation of the line through the given points.

8.1. $(-1, -5), (3, -1)$

$$y = x - 4$$

8.2. $(0, -5), (4, -1)$

$$y = x - 5$$

9. Write the slope-intercept form of the equation of the line described.

9.1. through $(-1, 4)$, parallel to $y = -7x - 3$

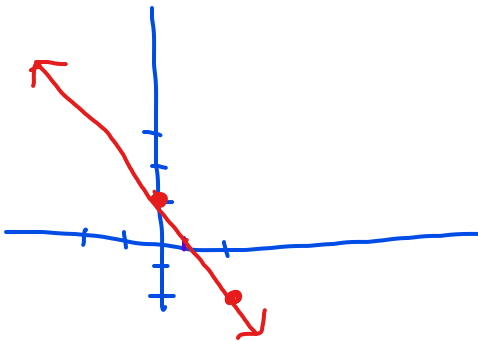
$$y = -7x + 3$$

9.2. through $(-1, 1)$, perpendicular to $y = x + 4$

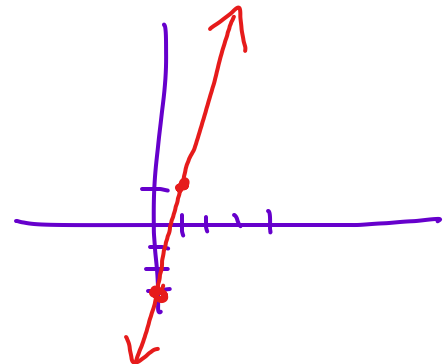
$$y = -x$$

10. Sketch the graph of each line.

10.1. $y = \frac{-3}{2}x + 1$



10.2. $y = 4x - 3$



11. Simplify. Your answer should contain only positive exponents.

11.1. $4u^{-3}v^3 \cdot 3v^3$

$$\frac{12v^6}{u^3}$$

11.2. $4a^3b^3 \cdot a^{-4}$

$$\frac{4b^3}{a}$$

$$11.3. \quad (m^4)^3 \cdot m^2 n^{-3} = \frac{m^{14}}{n^3}$$

$$11.5. \quad \frac{3xy^4}{2x^0 y^1 \cdot 4yx^{-2}} = \frac{3x^3 y^2}{8}$$

$$11.4. \quad (2mn^3)^2 \cdot m^4 n^3 = 4m^6 n^9$$

12. Simplify each expression.

$$12.1. \quad (4n^3 - 4n^2 - 5n) + (6n^2 + 5n^3 - 7n) = 9n^3 + 2n^2 - 12n$$

$$12.2. \quad (8x^2 - 8x^3 - 4x) - (5x + 8x^3 + 2x^2) = -16x^3 + 6x^2 - 9x$$

13. Find each product.

$$13.1. \quad (-7a + 8)(-4a + 1) = 28a^2 - 39a + 8$$

$$13.3. \quad (a + 7)(-3a - 5) = -3a^2 - 26a - 35$$

$$13.2. \quad (4n - 6)(3n + 4) = 12n^2 - 2n - 24$$

$$13.4. \quad (3v - 2)(3v + 2) = 9v^2 - 4$$

14. Factor the common factor out of each expression.

$$14.1. \quad 9x^2 + 10x^3 - 3x^4 - 9x^{11} = x^2(9 + 10x - 3x^2 - 9x^9)$$

$$14.2. \quad -24k^3 - 40k = -8k(3k^2 + 5)$$

15. Factor each completely.

$$15.1. \quad 6x^2 + 66x + 144 = 6(x^2 + 11x + 24) = 6(x+8)(x+3)$$

$$15.3. \quad 4y^2 + 10y + 4 = 2(2y^2 + 5y + 2) = 2(2y+1)(2y+2)$$

$$15.2. \quad x^2 - 4x - 21 = (x-7)(x+3)$$

$$15.4. \quad 2n^2 - 9n + 10 = (2n+1)(n-5)$$

$$15.5. \quad 30r^3 + 36r^2 + 25r + 30 = (30r^3 + 36r^2) + (25r + 30) = (5r+6)(6r^2 + 5)$$

$$15.6. \quad 21x^3 - 49x^2 + 12x - 28 = (21x^3 - 49x^2) + (12x - 28) = (7x^2 + 4)(3x-7)$$

16. Simplify.

$$16.1. \quad 7\sqrt{18} = 7\sqrt{9 \cdot 2} \\ = 21\sqrt{2}$$

$$16.2. \quad -7\sqrt{180} = -42\sqrt{5}$$

$$16.3. \quad 4\sqrt{63x} = 12\sqrt{7x}$$

$$16.4. \quad -2\sqrt{180x^2} = -12|x|\sqrt{5}$$

$$16.5. \quad \frac{-2}{5\sqrt{3}} = \frac{-2}{5\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{-2\sqrt{3}}{15}$$

$$16.6. \quad \frac{\sqrt{16}}{\sqrt{20}} = \frac{2\sqrt{5}}{5}$$

17. Find the distance between each pair of points.

17.1. $(3, -3), (-7, -3)$

$$\sqrt{(3+7)^2 + (-3+3)^2} = 10$$

17.2. $(-1, 6), (7, 1)$

$$\sqrt{(-1-7)^2 + (6-1)^2} \\ = \sqrt{64+25} \\ = \sqrt{89}$$

18. Find the midpoint of the line segment with the given endpoints.

18.1. $(6, -3), (10, -3)$

$$(8, -3)$$

18.2. $(-5, 8), (-7, 9)$

$$(-6, \frac{17}{2})$$

19. Solve each system by substitution.

19.1. $-3x + y = -7$
 $5x - y = 9$

$$(1, -4)$$

19.2. $-8x + 4y = -16$
 $x + 3y = 9$

$$(18\frac{3}{7}, 3\frac{1}{7})$$

20. Solve each system by elimination.

20.1. $9x - 3y = 21$
 $-9x + 4y = -28$ $(0, -7)$

20.2. $x + 8y = 23$
 $x - 9y = -28$ $(-1, 3)$

21. Simplify each expression.

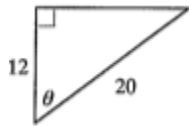
21.1. $\frac{\frac{4}{x^2}}{\frac{1}{2}} = \frac{4}{x^2} \cdot \frac{2}{1} = \frac{8}{x^2}$

21.2. $\frac{\frac{3}{m}}{\frac{m-3}{m^2}} = \frac{3 \cdot \cancel{m^2}}{m \cdot \cancel{m-3}}$
 $= \frac{3m}{m-3}$

22. Find the value of the trig function indicated.

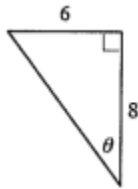
22.1. $\cos \theta$

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$\cos \theta = \frac{12}{20} = \frac{3}{5}$

22.2 $\sin \theta$



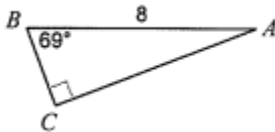
$6^2 + 8^2 = \text{hyp}^2$

$\sin \theta = \frac{6}{10} = \frac{3}{5}$

23. Solve each triangle. Round to the nearest tenth.

23.1

23.2

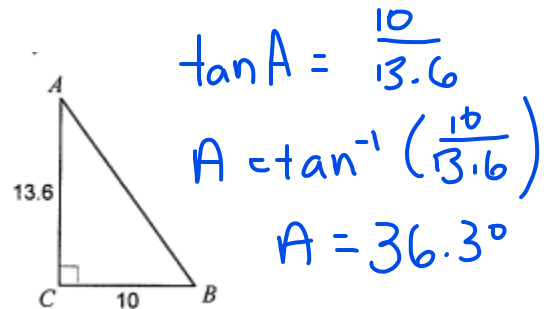


$\sin 69^\circ = \frac{AC}{8}$

$\angle A = 21^\circ$

$8 \cdot \sin 69^\circ = AC$
 $7.5 = AC$

$BC = 6.7$



$\tan A = \frac{10}{13.6}$
 $A = \tan^{-1} \left(\frac{10}{13.6} \right)$

$A = 36.3^\circ$

$AB = 16.9$

$\angle B = 53.7^\circ$