

Name KEY

Show your work on all problems, and leave your solutions in the simplest form possible.

Calculate using rules for order of operations [3 points each]

1. $\left[\frac{11}{10} \div (-11)\right] + \left(\frac{2^2}{5}\right)$

$$= \left[\frac{11}{10} \times \frac{-1}{11}\right] + \frac{4}{5}$$

$$= -\frac{1}{10} + \frac{4}{5}$$

$$= -\frac{1}{10} + \frac{8}{10} = \boxed{\frac{7}{10}}$$

2. $\frac{5 \times 4 - 15}{8 \div 4 \times 2} = \frac{20 - 15}{2 \times 2} = \boxed{\frac{5}{4}}$

3. $\frac{[(2-3)^3 - 5] \times |2-4|}{7^0 - 2 \times 5^2} = \frac{[(-1)^3 - 5] \times 1 - 2}{1 - 2 \times 25}$

$$= \frac{(-1-5) \times 2}{1-50} = \frac{-6 \times 2}{-49} = \boxed{\frac{12}{49}}$$

4. Solve for y and check your solution [5 points]

$$4(y+2)+2=-2y$$

$$4y+8+2=-2y$$

$$4y+10=-2y$$

$$-4y \quad -4y$$

$$10 = -6y$$

$$\Rightarrow \boxed{y = -\frac{10}{6} = -\frac{5}{3}}$$

Check:

$$4\left(-\frac{5}{3}+2\right)+2 \stackrel{?}{=} -2\left(-\frac{5}{3}\right)$$

$$4\left(\frac{1}{3}\right)+2 \stackrel{?}{=} \frac{10}{3}$$

$$\frac{10}{3} = \frac{10}{3} \checkmark$$

5. Solve for c [5 points]

$$100(F-32)-180c=0$$

$$100(F-32) = 180c$$

$$\boxed{c = \frac{100(F-32)}{180}}$$

6. Solve for r [5 points]

$$m = \frac{2}{3}ru^2$$

$$\frac{3}{2}m = ru^2$$

$$\boxed{r = \frac{3}{2} \frac{m}{u^2}}$$

Simplify, and express using positive exponents only [4 points each]

7. $(3a^{-5}b^{-7})(2ab^{-2})$

$$= 6a^{-4}b^{-9} = \frac{6}{a^4b^9}$$

8. $\frac{9a^6b^{-4}c^7}{27a^{-4}b^5c^9}$

$$= \frac{1}{3}a^{10}b^{-9}c^{-2} = \frac{a^{10}}{3b^9c^2}$$

Simplify and write the final result in scientific notation [3 points each]

9. $35,000,000 = 3.5 \times 10^7$

10. $(60 \times 10^4) \times (20 \times 10^{-3})$

$$= 1200 \times 10^1$$
$$= 1.2 \times 10^3 \times 10^1$$
$$= 1.2 \times 10^4$$

11. Answer questions a-d below for the following equation of a line:

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

a. What is the x-intercept? [3 points]

$$0 = \frac{-1}{2}x + 3$$

$$\frac{1}{2}x = 3 \Rightarrow x = 6 \quad \boxed{(6, 0)}$$

b. What is the y-intercept? [3 points]

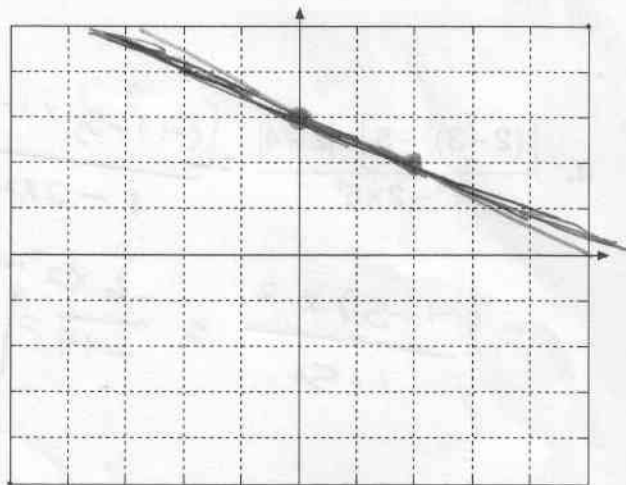
$$y = \frac{-1}{2}(0) + 3$$

$$y = 3 \quad \boxed{(0, 3)}$$

c. What is the slope of this line? [5 points]

$$m = -\frac{1}{2}$$

d. Graph the line on the coordinate system given below. [5 points]



12. Is the ordered pair $(-1, -2)$ on the graph of the equation $2y + x - 3 = 2$? [3 points]

$$2(-2) + (-1) - 3 \stackrel{?}{=} 2$$

$$-4 - 1 - 3 \stackrel{?}{=} 2$$

$$-8 \neq 2 \quad \text{No}$$

13. Find the function value $h(-3)$, where $h(x) = 2(-x^2) + |x| - 2$. [3 points]

$$h(-3) = 2(-(-3)^2) + |-3| - 2$$

$$= 2(-9) + 3 - 2$$

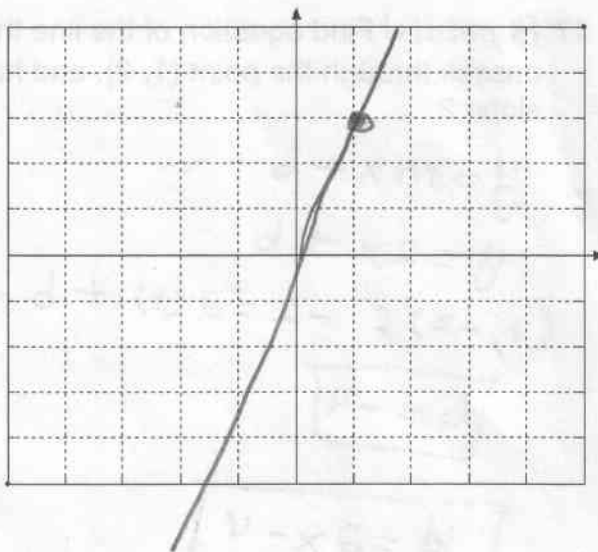
$$= -18 + 1$$

$$= \boxed{-17}$$

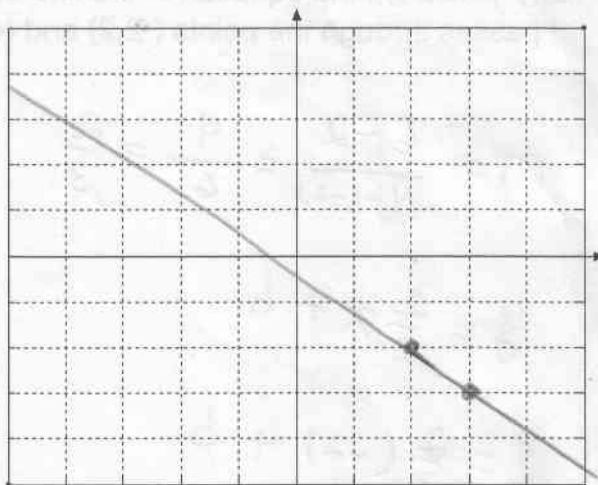
14. Write equation of a line that has slope $\frac{3}{4}$, and its y-intercept is $(0, -3)$. [5 points]

$$y = \frac{3}{4}x - 3$$

15. [5 points] Graph a line with slope of 3 on the following coordinate system:



16. [5 points] Without obtaining the equation of the line, graph a line with slope of -1 that passes through the point $(2, -2)$. Place your graph on the following coordinate system.



In problems 17-20 write the equations of the lines that you find in the slope-intercept form $y = mx + b$.

17. [8 points] Find equation of the line that passes through the point (1,-2), and has slope 2.

$$y = mx + b$$

$$y = 2x + b$$

$$(1, -2): -2 = 2(1) + b$$

$$b = -4$$

$$y = 2x - 4$$

18. [7 points] Find equation of the line that passes through the points (-2,2) and (4,6).

$$m = \frac{6-2}{4-(-2)} = \frac{4}{6} = \frac{2}{3}$$

$$y = \frac{2}{3}x + b$$

$$2 = \frac{2}{3}(-2) + b$$

$$2 = -\frac{4}{3} + b$$

$$b = 2 + \frac{4}{3} = \frac{6}{3} + \frac{4}{3} = \frac{10}{3}$$

$$y = \frac{2}{3}x + \frac{10}{3}$$

19. [5 points] Find equation of the line that passes through the point (1,-3) and is parallel to the line $2y - 4x = 5$.

$$2y = 4x + 5$$

$$y = 2x + \frac{5}{2}$$

$$m = 2$$

$$y = 2x + b$$

$$-3 = 2(1) + b$$

$$b = -5$$

$$y = 2x - 5$$

20. [5 points] Find equation of the line that passes through the point (1,1), and is perpendicular to the line $y = \frac{-1}{2}x + 300$.

$$m = 2$$

$$y = 2x + b$$

$$1 = 2(1) + b$$

$$b = -1$$

$$y = 2x - 1$$