

1. Solve  $m^2 - 28 = -8$

$$m^2 - 28 + 28 = -8 + 28$$

$$\sqrt{m^2} = \sqrt{20}$$

$$m = \pm \sqrt{20}$$

$$m = \pm 2\sqrt{5}$$

2. Let  $f(x) = 2x - 5$ . If  $f(x) = 15$ , what is the value of  $x$ ?

$$15 = 2x - 5$$

$$+5 \quad +5$$

$$20 = 2x$$

$$10 = x$$

3. What is the recursive rule for the sequence  $a_n = 2 + (-3)(n - 1)$ . Then find  $a_{20}$ .

$a_1 = 2 \quad d = -3$

$$a_n = a_{n-1} + d \quad a_1 = ?$$

$$a_n = a_{n-1} - 3, a_1 = 2$$

$$a_{20} = 2 + (-3)(19)$$

$$a_{20} = -55$$

4. Write a recursive rule and an explicit rule for the arithmetic sequence 19, 9, -1, -11, ...

$a_1 = 19 \quad d = -10$

Explicit:  $a_n = a_1 + d(n-1)$

$$a_n = 19 + (-10)(n-1)$$

$$19 - 10n + 10$$

$$a_n = -10n + 29$$

Recursive:  $a_n = a_{n-1} + d, a_1 = ?$

$$a_n = a_{n-1} - 10, a_1 = 19$$

5. A bird drops a stick from the top of Miami Tower. The height of the stick after  $x$  seconds is given by  $h(x) = 625 - 16x^2$ . What is the maximum value of  $h(x)$ ?

(y coord of vertex)

$$-\frac{b}{2a} = \frac{0}{2(-16)} = 0$$

$$625 - 0 = 625$$

$$y = 625$$

6. Which sequence below appears to be arithmetic? Explain.

- Geo  $\rightarrow$  A 6, 12, 24, 48, ...
- B** 15, 13, 11, 9, ...
- C 20, 30, 50, 80, ...
- Geo  $\rightarrow$  D 60, 30, 15, 7.5, ...
- $y = mx + b$

7. What is the slope of a line perpendicular to the line that passes through (0, 2) and (4, 5)?

$$\frac{5-2}{4-0} = \frac{3}{4}$$

$\uparrow$

$$-\frac{4}{3}$$

Negative Recip. Perpendicular slope

8. Which data set represents a direct variation? Explain.

A	C																
<table border="1"><tr><td>x</td><td>6</td><td>8</td><td>10</td></tr><tr><td>y</td><td>12</td><td>24</td><td>40</td></tr></table>	x	6	8	10	y	12	24	40	<table border="1"><tr><td>x</td><td>2</td><td>5</td><td>8</td></tr><tr><td>y</td><td>1</td><td>4</td><td>7</td></tr></table>	x	2	5	8	y	1	4	7
x	6	8	10														
y	12	24	40														
x	2	5	8														
y	1	4	7														
B	D																
<table border="1"><tr><td>x</td><td>-4</td><td>-1</td><td>6</td></tr><tr><td>y</td><td>-8</td><td>-2</td><td>12</td></tr></table>	x	-4	-1	6	y	-8	-2	12	<table border="1"><tr><td>x</td><td>1</td><td>-2</td><td>-3</td></tr><tr><td>y</td><td>3</td><td>-3</td><td>-5</td></tr></table>	x	1	-2	-3	y	3	-3	-5
x	-4	-1	6														
y	-8	-2	12														
x	1	-2	-3														
y	3	-3	-5														

9. Write the equation of a line in slope-intercept form that passes through (-1, 8) and (5, -2).

$$\frac{-2-8}{5-(-1)} = \frac{-10}{6} = -\frac{5}{3}$$

$$y = mx + b$$

$$8 = -1(-\frac{5}{3}) + b$$

$$\frac{24}{3} = \frac{5}{3} + b$$

$$-\frac{5}{3} - \frac{5}{3}$$

$$\frac{19}{3} = b$$

$$y = -\frac{5}{3}x + \frac{19}{3}$$

10. Solve  $\begin{cases} 2x + 5y = 4 \\ 3x + 5y = 1 \end{cases}$

$$x = -3$$

$$-9 + 5y = 1$$

$$+9 \quad +9$$

$$5y = 10$$

$$y = 2$$

$(-3, 2)$

11. The area of a rectangle is  $2x^2 - x - 21$  square meters. The width is  $2x - 7$  meters. What is the length?

**F**  $x - 3$       **H**  $2x - 3$

**G**  $x + 3$       **J**  $2x + 3$

$$2x^2 - x - 21$$

$$(2x - 7)(x + 3)$$

W                      L

12. On the graph below,  $f(x) = 3x^2$ . Which function could be represented by the dotted graph?

**F**  $g(x) = -4x^2$       **H**  $g(x) = \frac{1}{2}x^2$

**G**  $g(x) = -\frac{1}{2}x^2$       **J**  $g(x) = 4x^2$

Fractions are FAT!



13. Simplify  $4\sqrt{50} + \sqrt{98} - 2\sqrt{72}$

$$4\sqrt{50} + \sqrt{98} - 2\sqrt{72}$$

$$20\sqrt{2} + 7\sqrt{2} - 12\sqrt{2}$$

$$15\sqrt{2}$$

14. Simplify

a.  $\sqrt{18m^6n^9p^{11}}$

$$3m^3n^4p^5\sqrt{2np}$$

b.  $(2 + \sqrt{5})(2 - \sqrt{5})$

$$4 - 2\sqrt{5} + 2\sqrt{5} - 5 = 4 - 5 = -1$$

15. Simplify

a.  $\frac{5}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}} = \frac{5\sqrt{2}}{2}$

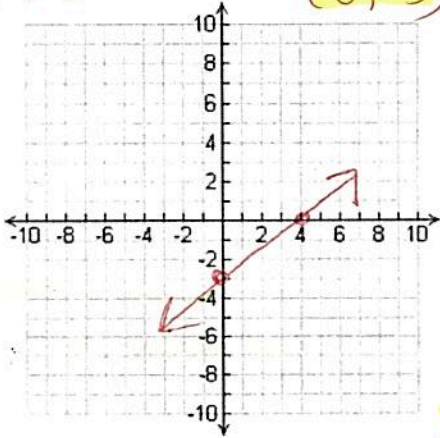
$$\frac{8\sqrt{2}}{2} = 4\sqrt{2}$$

b.  $(5\sqrt{2})^2$

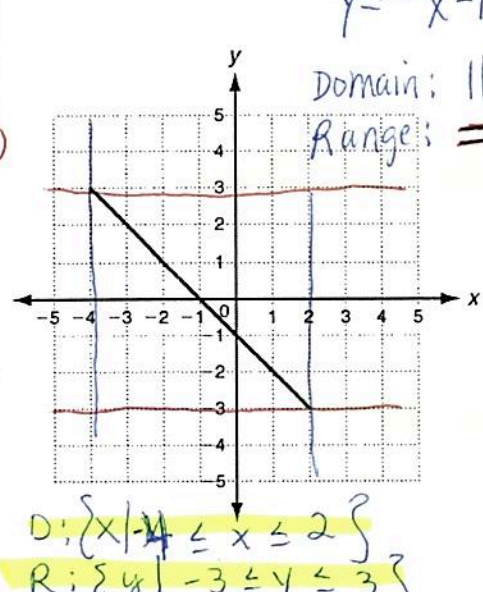
$$(5\sqrt{2})(5\sqrt{2}) = 25\sqrt{4} = 25 \cdot 2 = 50$$

16. Graph  $3x - 4y = 12$  using intercepts.

x-int:  $(4, 0)$   
y-int:  $(0, -3)$



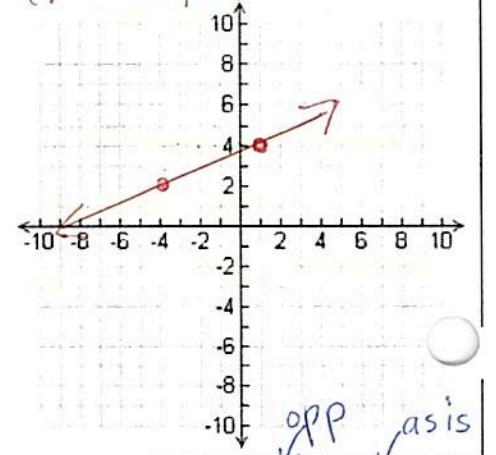
17. What is the domain and range of the relation below?



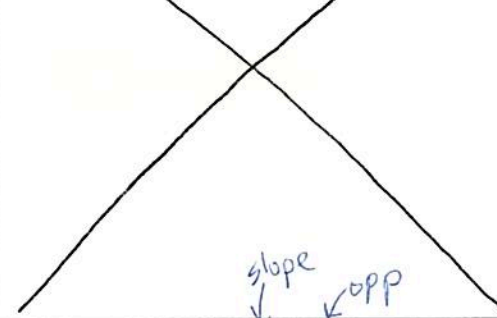
18. Graph  $y - 2 = \frac{2}{5}(x + 4)$

Point  $(x_1, y_1) = (-4, 2)$   
 $m = \frac{2}{5}$

$y - y_1 = m(x - x_1)$   
(pt. slope)



19. The value of y varies directly with x, and y = 7 when x = -21. Write a Direct variation equation. Find y when x = 24.



20. Simplify

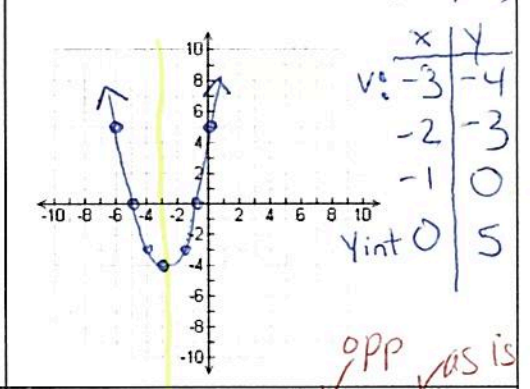
a.  $(x^3)^{-2} \cdot x^8$

$$x^{-6} \cdot x^8 = x^2$$

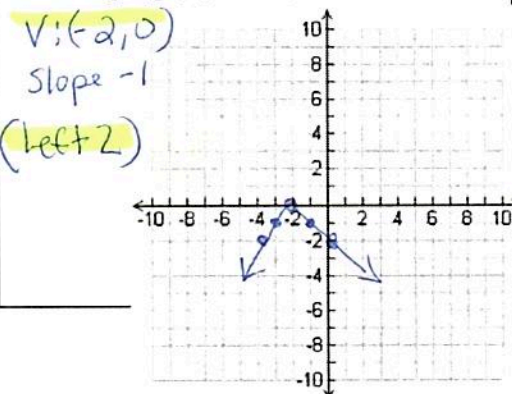
b.  $\frac{(x^{-3})^4 \cdot x^4}{2x^{-3}}$

$$\frac{x^{-12} \cdot x^4}{2x^{-3}} = \frac{x^{-8}}{2x^{-3}} = \frac{x^{-5}}{2} = \frac{1}{2x^5}$$

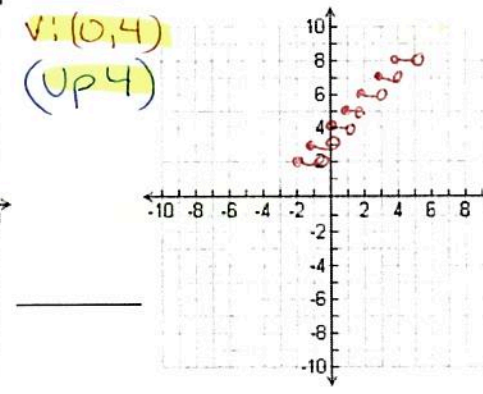
21. Graph  $f(x) = (x + 3)^2 - 4$



22. Graph  $g(x) = -|x + 2|$



23. Graph  $h(x) = [x] + 4$



24. Graph  $h(x) = \sqrt{x - 2} + 5$

