

$$3 \cdot 4$$

3 4's

4 3's

$$3 \cdot 4 = 4 + 4 + 4 = 12$$

or

$$3 \cdot 4 = 3 + 3 + 3 + 3 = 12$$

$$3^4$$

4 3's

$$3^4 = 3 \cdot 3 \cdot 3 \cdot 3 = 81$$

$$\begin{array}{ccc} & 3^4 & 3 \\ 3 & & \end{array}$$

$$\begin{array}{ccc} & & 3 \\ 4 & & \end{array}$$

$$-3-7+2$$

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

$$36\div 2\cdot 3$$

$$-6 - 3 \cdot 2^3 + (-4)^2$$

$$(-6 - 3) \cdot 2^3 + (-4)^2$$

$$-6 - 3 \cdot 2^3 + (-4)^2 = -$$

$$-9(2-5)-7$$

$$-9 \cdot 2 - (5-7)$$

$$30 \div 2 \cdot 5$$

$$30 \div (2 \cdot 5)$$

$$(30 \div 2) \cdot 5$$

$$6 - 8 \div 2$$

$$(6-8) \div 2$$

$$6 - (8 \div 2)$$

$$48 \div 8 \div 2$$

$$48 \div (8 \div 2)$$

$$(48 \div 8) \div 2$$

$$3 \cdot 5 - 3 \cdot 7$$

$$3(5-7)$$

$$3 \cdot (5-3) \cdot 7$$

$$3^4$$

$$5^3$$

$$2^5$$

$$7^2$$

$$(-4)^2$$

$$-4^2$$

$$(-$$

1,2,3 6 12 18 12 18
 6 = $GCF(12,18)$ 36 6
 12

2^2
5 3

2
20 27 20 27

20 27 3³
5

$LCM(20,27)=2$

y^{12}	x^7	y	x	$x^7y^8z^5$	$x^4y^{12}w$
	w	z		$x^7y^8z^5$	$x^4y^{12}w$
				$x^7y^8z^5$	$x^4y^{12}w$
				$x^7y^8z^5$	$x^4y^{12}w$

$$LCM(x^7y^8z^5, x^4y^{12}w) = x^7y^{12}z^5w$$

GCF($18x^4y$)

$3^2 \cdot 5 \cdot 7, 3 \cdot 7^2 \cdot 13$

$5^2 \cdot 11, 5 \cdot 7 \cdot 11^2$

$2^4 \cdot 5^2 \cdot 17, 2^2 \cdot 5^3$

$2^4 \cdot 3^2, 5^2 \cdot 13$

a^2b^3, ab^7

$x^3y^2z^5, x^5y^9z^2$

a^7bc^3, a^2b^5

x^3y^5w, xz^4w^8

$6x^3, 15x^7$

$12xy, 9x^3$

$8a^2b^7, 15a^4b^2$

$24y^{13}, 60y^{10}$

$51x^2w, 27w^5$

$9x^3, 8y^3$

$16ab^2, 52a^2b^5$

$48x^7y^3, 28y^7zw$

$8xy^2, 20x^3yw, 12x^4y^3w^5$

$21a^3b^9, 9a^7b^5, 15a^5b^{12}$

$18b^4c^3, 24c^6d^2, 42bc^2d^7$

$8x^5, 9x^{12}, 6x^7$

$$\frac{5}{12} + \frac{1}{4}$$

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

$$\frac{7}{12} + \frac{3}{16}$$

$$\frac{1}{2 \cdot 3^3} + \frac{7}{2^2 \cdot 3^2 \cdot 5}$$

12

$$\frac{12}{12} + \frac{4}{12}$$

$$\frac{5}{12} - \frac{1}{4}$$

$$\frac{5}{12} + \frac{1}{4} = \frac{5}{12} + \frac{1 \cdot 3}{4 \cdot 3}$$

$$= \frac{5}{12} + \frac{3}{12}$$

$$= \frac{8}{12}$$

$$= \frac{2}{3}$$

12

$$\frac{3}{16}$$

$$12 = 2^2 \cdot 3 \quad 16 = 2^4 \quad 48 = 2^4 \cdot 3 \quad 48$$
$$12 \quad 16 \quad 48 = 12 \cdot 4 \quad 48 = 16 \cdot 3$$

$$\frac{7}{12}$$

$$48$$

$$\frac{7}{12} + \frac{3}{16} = \frac{7 \cdot 4}{12 \cdot 4} + \frac{3 \cdot 3}{16 \cdot 3}$$

$$48$$

$$= \frac{28}{48} + \frac{9}{48}$$
$$= \frac{37}{48}$$

$$2 \cdot 3^3 \quad 2^2 \cdot 3^2 \cdot 5 \quad 2^2$$

$$\begin{aligned}\left(-\frac{1}{3}\right)^2 + 4 &= \frac{1}{9} + 4 \\ &= \frac{1}{9} + \frac{36}{9} \\ &= \frac{37}{9}\end{aligned}$$

$$\begin{aligned}-\frac{1}{3} \\ 4 &= \frac{36}{9}\end{aligned}$$

$$\begin{aligned}\frac{3}{x^2} - \frac{2}{y} \quad x &= -2 \quad y = -5 \\ x &= -2 \quad y = -5\end{aligned}$$

$$\begin{aligned}\frac{3}{x^2} - \frac{2}{y} &= \frac{3}{(-2)^2} - \frac{2}{(-5)} \\ &= \frac{3}{4} + \frac{2}{5}\end{aligned}$$

$$x = -2 \quad y = -5$$

rg q

$$\frac{6xy}{21x^3}$$

$$\frac{24x^2y^5}{16x^3y^8z^3}$$

$$7\frac{3}{4}$$

$$2\frac{4}{7}$$

$$5\frac{2}{3}$$

$$6\frac{7}{8}$$

$$\frac{a}{2} + \frac{b}{5}$$

$$\frac{a}{18} - \frac{b}{15}$$

$$\frac{x}{7} - \frac{y}{5}$$

$$\frac{x}{12} + \frac{y}{8}$$

$$\frac{2}{5} + \frac{5}{6}$$

$$\frac{2}{5} \cdot \frac{5}{6}$$

$$\frac{7}{8} - \frac{1}{6}$$

$$\frac{7}{8} \div \frac{1}{6}$$

$$3\frac{3}{5} + 1\frac{2}{5}$$

$$4\frac{2}{3} - 3\frac{3}{4}$$

$$3 - \frac{2}{5}$$

$$\frac{3}{4} \div \frac{9}{8}$$

$$\frac{3}{4} \cdot \frac{8}{15}$$

$$\frac{2}{3} \div 7$$

$$\left(-\frac{3}{4}\right)$$

0.00154

0.005

97.3

x

x

17

x

93

x

$$2^3 \cdot 3^2 = 72$$

$$\frac{23}{36}, \frac{15}{24} \qquad \frac{-17}{12}, -1\frac{3}{8}$$

$$36 = 2^2 \cdot 3^2 \qquad 24 = 2^3 \cdot 3$$

$$\frac{23}{36} = \frac{23 \cdot 2}{36 \cdot 2} = \frac{46}{72} \quad \text{and} \quad \frac{15}{24} = \frac{15 \cdot 3}{24 \cdot 3} = \frac{45}{72}$$

$$\frac{23}{36} > \frac{15}{24}$$

$$-\frac{17}{12} \qquad -\frac{11}{8} \qquad -1\frac{3}{8} \qquad -\frac{11}{8}$$

$$24 \qquad 24$$

$$-\frac{17}{12} = -\frac{17 \cdot 2}{12 \cdot 2} = -\frac{34}{24} \quad \text{and} \quad -\frac{11}{8} = -\frac{11 \cdot 3}{8 \cdot 3} = -\frac{33}{24}$$

$$-\frac{17}{12} < -\frac{11}{8} \qquad -\frac{34}{24} \qquad -\frac{33}{24}$$

$$39.42178 \quad 39.4231 \qquad -0.87263 \quad -0.872904 \qquad \frac{5}{12} \quad 0.416$$

39.42178
39.4231

1 m [

m j [

-0.872904

-0.87263

$$\frac{15}{22} \quad \frac{30}{44}$$

$$\text{sec} = \text{min} \times \frac{\text{sec}}{\text{min}}$$

$$180 \text{ sec} = 3 \text{ min} \times 60^{\text{sec}}$$

480

1380

3

x

$$\frac{x \text{ mg}}{180 \text{ lb}} = \frac{2 \text{ mg}}{140 \text{ lb}}$$

$$x = 180 \cdot \frac{2}{140} = 2.57143$$

$$7 \frac{\text{dollars}}{\text{hour}} \times 22 \text{ hours} + (7+r) \text{ dollars}$$

$$1\frac{1}{2}$$

x

x

x

x

n

n

$$\frac{3}{7}$$

$$\frac{5}{8}$$

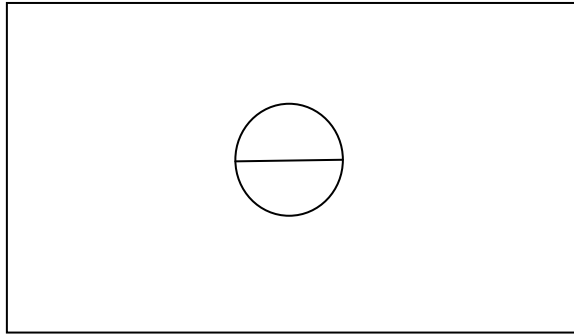
≈

≈

≈

A

P



$$l = 40 \quad w = 25$$
$$A = \pi r^2 \quad r = 3$$

$$A = lw$$

$$\text{Tiled Area} = lw - \pi r^2 = 40 \cdot 25 - \pi \cdot 3^2 = 1000 - 9\pi \approx 971.726$$

$$\text{Cost} = (1000 - 9\pi) \text{ ft}^2 \times 3 \frac{\text{dollars}}{\text{ft}^2} \approx 2915.18$$

\$2,915

n
 n

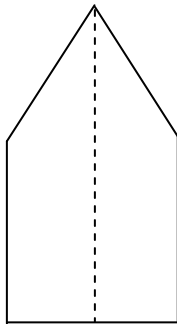
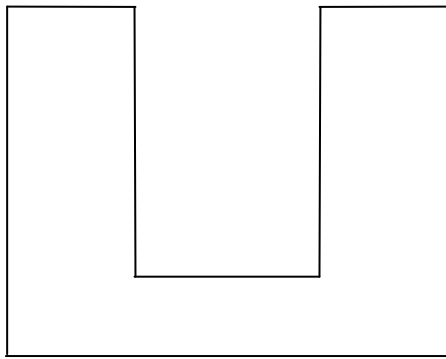
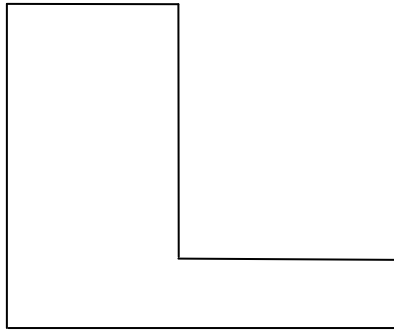
n
 n

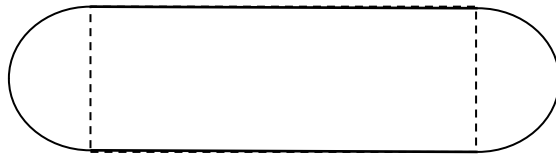
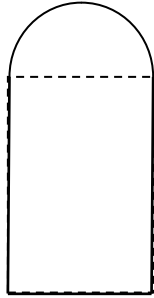
n
 n

n
 n

b

b





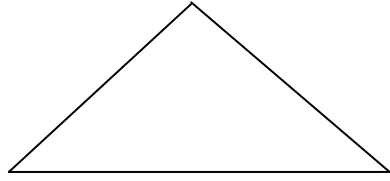
(5,2) (8,1) (5,-3) (-1,-3) (-3,-1)

(-1,2)

(-1,2)

y

P



90°

$$a^2 + b^2 = c^2$$

k

$$|AB| = k|A'B'| \quad |AC| = k|A'C'| \quad |BC| = k|B'C'|$$

$$\begin{array}{ccc} & |AB| & AB \\ ABC & A'B'C' & ABC \\ A'B'C' & k > 1 & \\ & k < 1 & \\ & k = 1 & \end{array}$$

k

$$k = \frac{|AB|}{|A'B'|} = \frac{|AC|}{|A'C'|} = \frac{|BC|}{|B'C'|}$$

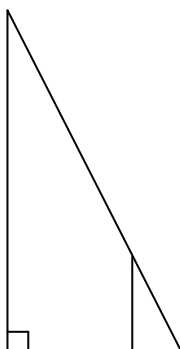
$$\frac{|DE|}{|BC|} = |AD|$$

$$18 \frac{\text{feet}}{\text{sec}} \times 5 \text{ sec} = 90 \text{ feet}$$

d

$$d^2 = 50^2 + 90^2 = 10600$$

$$d = \sqrt{10600} \approx$$



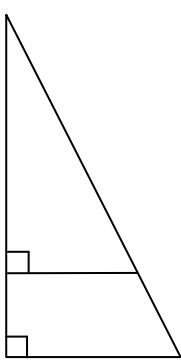
DE

ABC

AD
B

D

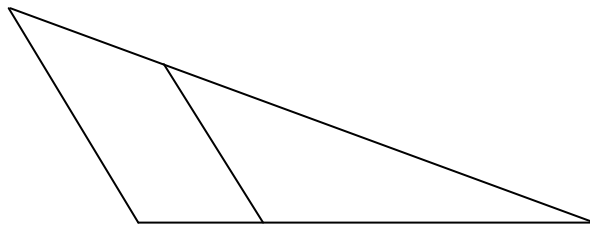
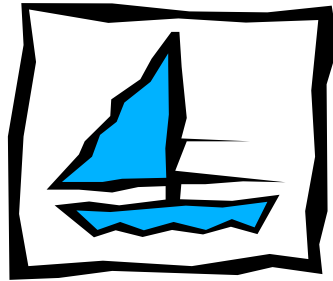
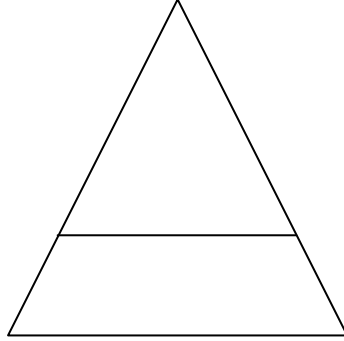
AB



AB
ABC

DE
DE

BC AD



7

L

$$\frac{x^{-3}y^{-2}}{x^5y^{-7}z^{-4}}$$

$$\begin{aligned}\frac{x^{-3}y^{-2}}{x^5y^{-7}z^{-4}} &= x^{-3} \cdot \frac{1}{x^5} \cdot y^{-2} \cdot \frac{1}{y^{-7}} \cdot \frac{1}{z^{-4}} \\ &= \frac{1}{x^3} \cdot \frac{1}{x^5} \cdot \frac{1}{y^2} \cdot y^7 \cdot z^4 \\ &= \frac{y^7z^4}{x^3}\end{aligned}$$

$$a^{-n} = \frac{1}{a^n}; a^n = \frac{1}{a^{-n}}$$

$$\left(\frac{a^2b}{c^3}\right)^{-2} = \frac{(a^2b)^{-2}}{(c^3)^{-2}}$$

$$\frac{(-2)^3}{-3} = \frac{-8}{-3} = \frac{8}{3}$$

$$(-2x^4)^3$$

$$(6y)^3$$

$$(-3a^4bc^5)^2$$

$$x^3 x^{-4}; \quad x=5$$

$$(2x^{-1})^3; \quad x=3$$

$$x^{-2} + y^{-2}; \quad \underline{\underline{\quad}}$$

$$(x^{-2})^3; \quad x=-2$$

$$(x^2 + y^2)^{-1}; \quad x=-1, y=2$$

$$\sqrt{a} \quad a$$

$$\sqrt{x^6} = \sqrt{(x^3)^2} = x^3 \quad \sqrt{x^{18}} = \sqrt{(x^9)^2} = x^9 \quad \sqrt{x^2} = x$$

$$\sqrt{x^9} = \sqrt{x^8 x} = \sqrt{x^8} \sqrt{x} = x^4 \sqrt{x}$$

$$\sqrt{36x^4 y^7}$$

$$\sqrt{27x^5}$$

$$\sqrt{\frac{8x^2 y^4}{x^6 y}}$$

$$\sqrt{\frac{40x^3 y^2 z}{2x^{-5} y^{-3}}}$$

$$\begin{aligned} \sqrt{36x^4 y^7} &= \sqrt{36} \sqrt{x^4} \sqrt{y^7} \\ &= 6 \sqrt{x^4} \sqrt{y^6 y} \\ &= 6 \sqrt{x^4} \sqrt{y^6} \sqrt{y} \\ &= 6x^2 y^3 \sqrt{y} \end{aligned}$$

$$\sqrt{36} = 6$$

$$y^7 = y^6 y$$

$$\sqrt{x^4} = x^2 \quad \sqrt{y^6} = y^3$$

$$\sqrt{36x^4 y^7}$$

$$\sqrt{27x^5} = \sqrt{9 \cdot 3x^4 x}$$

$$27 = 9$$

$$\sqrt{x^3y^4}; \quad x=3, y=2$$

$$\sqrt{x^3y^5}; \quad x=4, y=7$$

$$\sqrt{44x^5}; \quad x=7$$

$$\sqrt{98x^6}; \quad x=2$$

$$\sqrt{\frac{18x^5}{2x^{-2}}}; \quad x=4$$

$$\sqrt{\frac{x^3y^{-4}}{x^7y^{-2}}}; \quad x=3, y=5$$

$n > 0$ $a^{m/n} = (\sqrt[n]{a})^m$ or equivalently $a^{m/n} = \sqrt[n]{a^m}$ a	m/n n	m	n $a \geq 0$
---	--------------	-----	-------------------

p q

$$a^p a^q = a^{p+q}$$

$$a^p$$

$$5^{3/2} 5^{1/2} = 5^{3/2+1/2} = 5^2 = 25$$

$$8^{-1/3} 8^{2/3} = 8^{-1/3+2/3} = 8^{1/3} = 2$$

$$\sqrt[3]{2}$$

$$2^{1/3}$$

$$5^{-2/3} = 1$$

$$\frac{a^p}{a^q} = a^{p-q}$$

$$\frac{1}{a^q} = a^{-q} \quad p=0$$

$$\left(-\frac{8}{27}\right)^{\frac{2}{3}}$$

$$\frac{1}{\sqrt{3}}$$

$$\sqrt[3]{7^2}$$

$$\sqrt{5^3}$$

$$\frac{1}{\sqrt[3]{x^7}}$$

$$3x^2 - 7x - 4$$

$$6(2x^2 - 3x + 8) = 12x^2 - 18x + 48 \quad \text{and} \quad 2x^3(x^2 - 4) = 2x^5 - 8x^3$$

$$\begin{aligned} &3(x^2 - x + 5) - 2(4x^2 - 5x - 3) \\ &\quad 3x^2 - 5x + 4 \quad x^3 - x^2 + 6x \\ &3x^2(x - 4) + 4(x^3 + 7x^2 - 5) \end{aligned}$$

$$= 3x^3 - 12x^2 + 4x^3 + 28$$

$$2x^2(x^3 - 8x)$$

$$2x^2(x^3 - 8x) = 2x^2 \cdot x^3 - 2x^2 \cdot 8x = 2x^5 - 16x^3$$

$$(2x - 3)(4x + 5) \quad 4x + 5$$

$$\begin{aligned}(2x - 3)(4x + 5) &= 2x(4x + 5) - 3(4x + 5) \\ &= 2x \cdot 4x + 2x \cdot 5 - 3 \cdot 4x - 3 \cdot 5 \\ &= 8x^2 + 10x - 12x - 15 \\ &= 8x^2 - 2x - 15\end{aligned}$$

$$\begin{array}{ll}
 3x^2y(x^4 - 2x^2y^2 + 5y^4) & (2x+3y)^2 \\
 5(2a^2 - 3b^2)(4a^2 + b^2) & (x+2y)(x^2 - 3xy + y^2)
 \end{array}$$

$$3x^2y(x^4 - 2x^2y^2 + 5y^4) = 3x^6y - 6x^4y^3 + 15x^2y^5$$

$$(2x+3y)^2$$

$$\begin{aligned}
 (2x+3y)^2 &= (2x+3y)(2x+3y) && (2x+3y)^2 \\
 &= 2x \cdot 2x + 2x \cdot 3y + 3y \cdot 2x + 3y \cdot 3y \\
 &= 4x^2 + 6xy + 6xy + 9y^2 \\
 &= 4x^2 + 12xy + 9y^2
 \end{aligned}$$

$$= x^3 - x^2y - 5xy^2 + 2y^3$$

$$a(b+c)$$

$$ab+ac$$

$$ab+ac$$

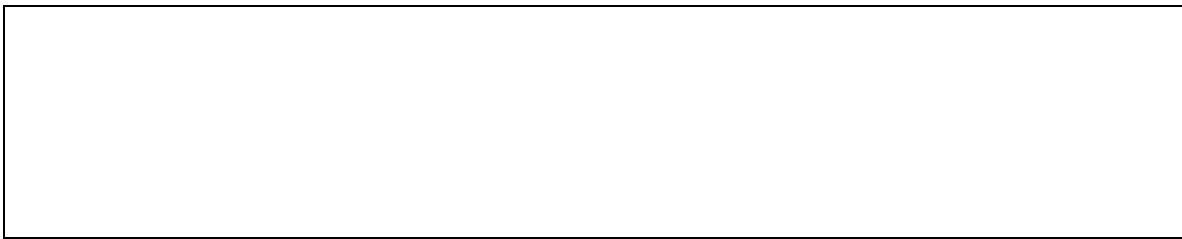
-12		
12,-1	$(x+12)(x-1)$	$11x$
-12,1	$(x-12)(x+1)$	$-11x$
6,-2	$(x+6)(x-2)$	$4x$
-6,2	$(x-6)(x+2)$	$-4x$
4,-3	$(x+4)(x-3)$	x
-4,3	$(x-4)(x+3)$	$-x$

$$x^2 + 4x - 12 = (x+6)(x-2) \quad 4x$$

$$x^2 - x - 12 = (x-4)(x+3) \quad -x$$

$$x^2 + 2x - 12$$

$$2x \quad x^2 + 2x - 12$$



$$3x^2 - 13x - 10$$

$$3x^2 + 7x - 10$$

$$3x^2 - 5x - 10$$

3

x^2 -10

3	-10		
3,1	10,-1	$(3x+10)(x-1)$ $(3x-1)(x+10)$	$7x$ $29x$
3,1	-10,1	$(3x-10)(x+1)$ $(3x+1)(x-10)$	$-7x$ $-29x$
3,1	5,-2	$(3x+5)(x-2)$ $(3x-2)(x+5)$	$-x$ $13x$
3,1	-		

$$A^2 - B^2 = (A - B)(A + B)$$

$$25x^2 - 9 \quad x^2 - 4y^2 \quad a^4 - 16b^4$$

$$25x^2 - 9 = (5x)^2 - (3)^2$$

$$A = 5x \quad B = 3$$

$$\begin{aligned} 25x^2 - 9 &= (5x)^2 - (3)^2 \\ &= (5x - 3)(5x + 3) \end{aligned}$$

$$x^2 - 4y^2 = (x)^2 - (2y)^2$$

$A =$

$$8x^3y^2 - 2xy^4 = 2xy$$

$$5x^2 - 23x + 24 = (5x \quad)(x \quad)$$

$$5x^2 + 14x - 24 = (5x \quad)(x \quad)$$

$$2x^2 + 5x - 3$$

$$2y^2 - 19y - 10$$

$$3a^2 + 8a + 5$$

$$5x^2 + 7x - 6$$

$$3t^2 + 13t - 10$$

$$3y^2 - 2y - 1$$

$$4x^2 - 4x - 3$$

$$4x^2 - 11x - 3$$

$$9a^2 - 18a - 16$$

$$4y^2 + 12y + 9$$

$$6x^2 - x - 12$$

$$2y^2 - 11y + 14$$

$$6b^2 + 7b - 3$$

$$4s^2 - 9s + 2$$

$$15x^2 + 16x + 4$$

$$8t^2 + 5t - 22$$

$$2x^2 + xy - 6y^2$$

$$2s^2 - 11st + 5t^2$$

$$6a^2 - 7ab + 2b^2$$

$$9x^2 + 24$$

$$6x^2 - xy - 12y^2$$

$$3x^2 + 10xy - 24y^2$$

$$5ab^2x^2 - 10ab^2x - 15ab^2$$

$$24a^2 - 18ab + 3b^2$$

$$x^4 + 5x^2 + 6$$

$$2x^4 - 5x^2 + 3$$

$$x^4 - y^4$$

$$a^6(a+1)^2 + a^7(a+1)$$

$$(x-2)(x+5)^2 + (x-2)^2(x+5)$$

$$x^2(x^2-1) - 9(x^2-1)$$

$$9x^4 - 49$$

$$5a^3 - 125a$$

$$x^2(x-3) - 4(x-3)$$

$$a^2(x-y) - b^2(x-y)$$

$$5x^4 - 80y^4$$

$$4x^2 + 24xy + 36y^2$$

$$\frac{a^2b^3 - a^2b}{a^2b + a^2}$$

$$\frac{a^2b^3 - a^2b}{a^2b + a^2} = \frac{a^2(b^3 - b)}{a^2(b+1)}$$

$$= \frac{b(b^2 - 1)}{b+1}$$

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

$$= b(b-1)$$

$$a^2$$

$$a^2 \quad b^3 - b$$

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

$$b+1$$

$$\frac{y^2 - x^2}{x^2 - xy}$$

$$\frac{y^2 - x^2}{x^2 - xy} = \frac{(y-x)(y+x)}{x(x-y)}$$

$$= \frac{-(x-y)(y+x)}{x(x-y)}$$

$$= -\frac{y+x}{x}$$

$$y-x = -(x-y)$$

$$x-y$$

$$45a^3b^4$$

$$9a^5b$$

$$\frac{18x^4y^7}{24x^8y^4z}$$

$$\frac{6(x+4)^3(x-2)^2}{30(x+4)^2}$$

$$\frac{4(a-b)(a+b)^2}{7(b-a)(a+b)^2}$$

$$\frac{(x-2)(3x+5)^2}{(2-x)(3x+5)^3}$$

$$\frac{x^3+3x^2}{x^2+2x^4}$$

$$\frac{3x^2-15x}{12x-60}$$

$$\frac{a^2b^2+a^2b^4}{a^2b^2+a^4b^2}$$

$$\frac{x^2y}{x^2y+x^4y^2}$$

$$\frac{x^3yz+xy^3z+xyz^3}{x^2y^2z^2}$$

$$\frac{6t^4-18t^3}{4t^2-12t}$$

$$\frac{t^3-2t^2+t}{t^2-t}$$

$$\frac{2a^2b^2-10a^6b^8}{2a^2b^2}$$

$$\frac{x^2-4}{x+2}$$

$$\frac{x^2+4x+3}{x+1}$$

$$\frac{x^2+6x+8}{x^2+5x+4}$$

$$\frac{(a-3)^2}{a^2-9}$$

$$\frac{x^2+2x-3}{x^2+x-6}$$

$$\frac{6x+12}{x^2+5x+6}$$

$$\frac{4x^2-4}{12x^2+12x-24}$$

$$\frac{4y^3+4y-8y}{2y^3+4y-6y}$$

$$\frac{y^2-y-12}{y^2+5y+6}$$

$$\frac{2x^2+5x-3}{3x^2+11x+}$$

$$3x^2 +$$

$$= \frac{x^5}{5x-10} \cdot \frac{2x-4}{x^2}$$

$$= \frac{x^5}{5(x-2)} \cdot \frac{2(x-2)}{x^2}$$
$$= \frac{2x^3}{5}$$

$$\frac{x^2}{2x-4}$$

$$2x-4 \quad 5x-10$$

$$\frac{3x^2}{x^2-9} \cdot \frac{x+3}{12x}$$

$$\frac{2x^2+7x-4}{2x^2-3x+1} \cdot \frac{3-x}{x-3}$$

$$\frac{x^2-x-6}{x^2-1} \cdot \frac{x+1}{x-3}$$

$$\frac{x^2+5x+6}{x^2+2x} \cdot \frac{x^3+x}{x^2+4x+3}$$

$$\frac{x^2y+3xy^2}{x^2-9y^2} \cdot \frac{x^2-2xy-3y^2}{5x^2y}$$

$$\frac{2x^2+3x+1}{x^2+2x-15} \div \frac{x^2+6x+5}{2x^2-7x+3}$$

$$\frac{x^4}{x+2} \div \frac{x^3}{x^2+4x+4}$$

$$\frac{3x^2+2x-1}{x^2-1} \cdot \frac{x^2-2x+1}{3x^2-7x+2}$$

$$\frac{2a^2-ab-b^2}{a^2-2ab+b^2} \cdot \frac{2a^2+ab-3b^2}{2a^2+3ab+b^2}$$

$$\frac{x^2-2x-15}{x^2-4x-5} \cdot \frac{x^2+8x+7}{x^2+7x+12}$$

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

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

$$(x-2)(x+1)$$

$$\begin{aligned} &= \frac{2(x+1) - 3(x-2)}{(x-2)(x+1)} \\ &= \frac{2x+2-3x+6}{(x-2)(x+1)} \\ &= \frac{-x+8}{(x-2)(x+1)} \end{aligned}$$

$$2y + \frac{3}{y+1}$$

$$\frac{1}{x^2+4x+4} - \frac{x+1}{x^2-4}$$

$$\frac{3}{t} - \frac{2}{t+2} + \frac{4}{t^2+2t}$$

$$\frac{1}{2y} \quad \frac{1}{y+1} \quad \frac{1}{y+1}$$

$$\frac{2y}{y+1} \quad \frac{3}{y+1}$$

$$y+1$$

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

$$\begin{aligned} \frac{1}{x^2+4x+4} - \frac{x+1}{x^2-4} &= \frac{1}{(x+2)^2} - \frac{x+1}{(x-2)(x+2)} \\ &= \frac{x-2}{(x+2)^2(x-2)} - \frac{(x+1)(x+2)}{(x-2)(x+2)(x+2)} \end{aligned}$$

$$7x - 20 = 2x - 5 \quad x$$

$$7x - 20 = 2x - 5$$
$$x$$

$$2(3x - 1) - 5(2 - x) = 7$$

$$x$$

$$x$$

$$\frac{2x-1}{3} = \frac{x+1}{4}$$

$$12\left(\frac{2x-1}{3}\right) = 12\left(\frac{x+1}{4}\right)$$

12

$$4(2x-1) = 3(x+1)$$

$$8x-4 = 3x+3$$

$$5x = 7$$

4

3x

$$x = \frac{7}{5}$$

5

$$x = 0.15x + 2000$$

0.15x

$$x - 0.15x = 2000$$

x

$$x - 0.15x = (1 - 0.15)x = 0.85x$$

$$30\left(\frac{4}{5}x\right) = 30\left(\frac{2}{3}x + \frac{1}{6}\right)$$

$$24x = 20x + 5$$

4

30

$$\frac{5}{9}(27) = \frac{5}{9}\left(\frac{9}{5}C\right)$$
$$15 = C$$

$$\frac{5}{9}$$

15

x

$$3x - 5 = 13$$

$$6 - 2x = -8$$

$$5 = 3x - 9$$

$$-2 = 4 - x$$

$$3x + 7 = 5x - 11$$

$$9x + 4 = -4x - 7$$

$$2(3x - 7) = 8x + 10$$

$$4(x - 1) = 6(3 - 2x)$$

5

$$0.05x = x - 190$$

$$0.07x + 0.05(1000 - x) = 65$$

$$25 = \frac{5}{3}(x - 12)$$

$$16 = \frac{4}{7}x - 8$$

$$\frac{1}{4}x - \frac{2}{3} = 1$$

$$\frac{7}{5}x - 7 = 2.8$$

$$\frac{2}{5}(x + 3) = x - 1$$

$$18\pi + 6\pi$$

ab

$$\frac{r}{a} - \frac{3t}{b} = 2$$

$$\begin{aligned}\frac{r}{a} - \frac{3t}{b} &= 2 \\ ab \left(\frac{r}{a} - \frac{3t}{b} \right) &= 2ab \\ br - 3at &= 2ab \\ br - 2ab &= 3at \\ \frac{br - 2ab}{3a} &= t\end{aligned}$$

ab

$$3at \qquad 2ab$$

$$3a$$

$$t = \frac{br - 2ab}{3a}$$

$$ax - 3(b - cx) = dx; \text{ for } x$$

$$\frac{x - a}{y + b} = \frac{cx}{d}; \text{ for } x$$

$$-3(b - cx) = -3b + 3cx$$

x

$$\begin{aligned}ax - 3(b - cx) &= dx \\ ax - 3b + 3cx &= dx \\ ax + 3cx - dx &= 3b \\ (a + 3c - d)x &= 3b \\ x &= \frac{3b}{a + 3c - d}\end{aligned}$$

$$3b \qquad dx$$

x

$a +$

$$d(y+b)$$

$$\frac{x-a}{y+b} = \frac{cx}{d}$$

$$V = \frac{1}{3} \pi r^2 h$$

$$F = \frac{9}{5} C + 32$$

F

C

C

z

$$z = \frac{x - \bar{x}}{s}$$

\bar{x}

s

cm

|

|

$$0.75x = 247.50$$

$$0.75x = \frac{247.50}{0.75}$$

$$x = 330$$

0.75

x

$$0.03x + 0.035(50000 - x) = 1687.50$$

$$0.03x$$

$$2x+2(x+3)$$

$$2x+2(x+3)$$

$$7.50(2x+2(x+3))=345$$

$$7.50(2x+2(x+3))=345$$

$$7.50(4x+6)=345$$

$$30x+45=345$$

$$30x=300$$

$$x=10$$

$$45$$

$$30$$

$$x=10$$

$$x+3=13$$

t

$$2 \text{ min} \times \frac{1 \text{ hour}}{60 \text{ min}} = \frac{1}{30} \text{ hour}$$

$$t + \frac{1}{30}$$

$$\frac{1}{3}x$$

$$10x + 25 \frac{1}{2}x$$

x S
 x x x S
 x x
 x x
 x x
 x x
 x h h x
 x x
 x x x $3\frac{1}{2}$ x
 x x x
 x x x
 x x x
 x x
 x x
 x x
 x x

x

x

x

x

x

x

x

$$\leq \qquad \qquad \qquad \geq$$

$$3 \leq 7 - 2$$

$$2x - 3 \leq 9$$

x

$$2x - 3 \leq 9$$

x

x

x	$2x - 3 \leq 9$	
	$2 \cdot 4 - 3 = 5 \leq 9?$	
	$2 \cdot 5 - 3 = 7 \leq 9?$	
	$2 \cdot 6 - 3 = 9 \leq 9?$	
	$2 \cdot 7 - 3 = 11 \leq 9?$	

' 8 3 1 2 9

$$2x - 3 \leq 9$$

$$2x - 3 \leq 9$$

$$2x \leq 12$$

$$x \leq 6$$

3

2

$$-4 < 6$$

$$-7 < -3$$

a b

$[a, b]$

(a, b)

a

b

a

b

$a < b$

a

b

a

b

$$\frac{1}{2}x - \frac{2}{3}x > \frac{1}{3} + x$$

$$6 \frac{1}{2}$$

$$\frac{2x}{3} < 3.8$$

$$2 - (1 - 3x) \geq 5 - 2(3 - x)$$

$$\frac{1}{2} \left(x - \frac{1}{3} \right) > 2$$

$$7x + 1 \leq 3 - (2x - 4)$$

$$\frac{3}{4}x - \frac{2}{5}x > 1$$

$$2(1 - 3x) \leq 3(2 + x)$$

$$0.01x + 2.6 \geq 1.3$$

$$-\frac{5}{3}x - 18 > x + \frac{1}{3}x$$

$$\frac{1}{3}x - \frac{1}{4}x \leq 5 - x$$

$$\frac{5x}{12} \geq \frac{7x}{18} + \frac{1}{6}$$

$$\text{slope} = \frac{\text{change in } y}{\text{change in } x} = \frac{-2}{4} = -\frac{1}{2}$$

(6, -1) (2, 1) x
y

$$\text{slope} = \frac{\text{change in } y}{\text{change in } x} = \frac{2}{-4} = -\frac{1}{2}$$

(1, 3)
(1, 3) x
y (2, 5)
x y

y

[

f

$(-4, 0), (0, 2)$

$(0, 0), (4, 3)$

$(3, -5), (3, 2)$

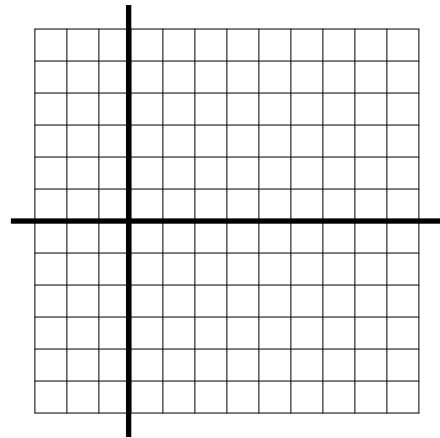
$(4, -2), (4, 3)$

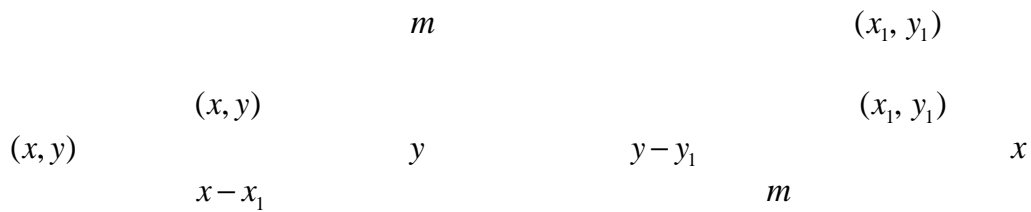
$(-1, 0), (-3, 0)$

$(-2, 3), (3, -2)$

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

$(1, 1), (4, 3)$





$$\frac{\text{change in } y}{\text{change in } x} = \frac{y - y_1}{x - x_1} = m$$

y

$$\begin{aligned} \frac{y - y_1}{x - x_1} &= m \\ y - y_1 &= m(x - x_1) \\ y &= m(x - x_1) + y_1 \\ y &= mx - mx_1 + y_1 \\ y &= mx + b \end{aligned}$$

$$\begin{aligned} &x - x_1 \\ &y_1 \\ b &= -mx_1 + y_1 \end{aligned}$$

x	$y = \frac{3}{2}x - 4$
-----	------------------------

$$2x - 3y = 6$$

$$-3y$$

$$\begin{array}{ccccccc} & & & & (3,1) & (5,0) & \\ & & & & & & (3,1) \\ (5,0) & x & & 2 & & y & 1 \end{array}$$

$$\text{slope} = \frac{\text{change in } y}{\text{change in } x} = \frac{-1}{2} = -\frac{1}{2}$$

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

$$0 = -\frac{1}{2}(5) + b$$

$$b = \frac{5}{2}$$

$$y = -\frac{1}{2}x + \frac{5}{2}$$

$$y = \frac{2}{3}x - 4$$

$$y = -\frac{3}{5}x - 2$$

x y

$$x + y = 4$$

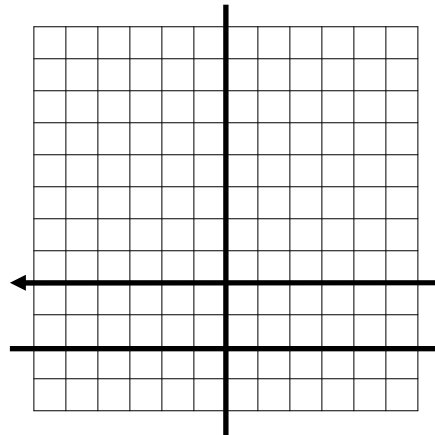
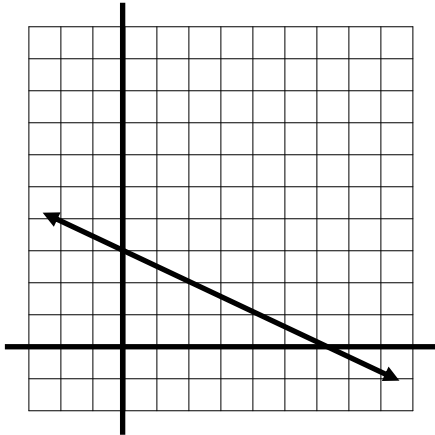
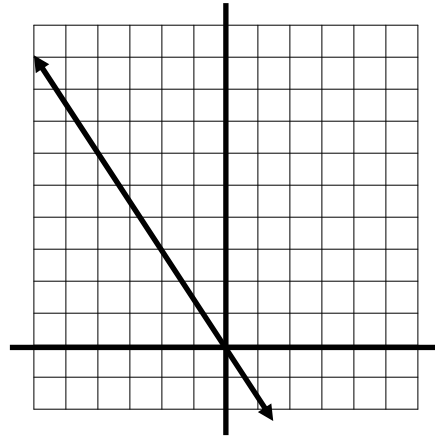
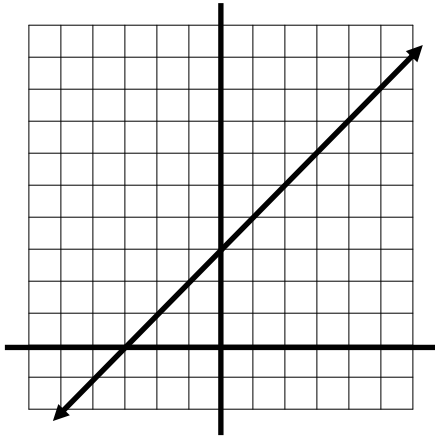
$$3x - 2y = 6$$

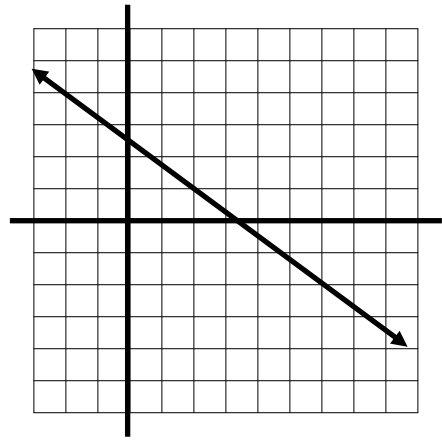
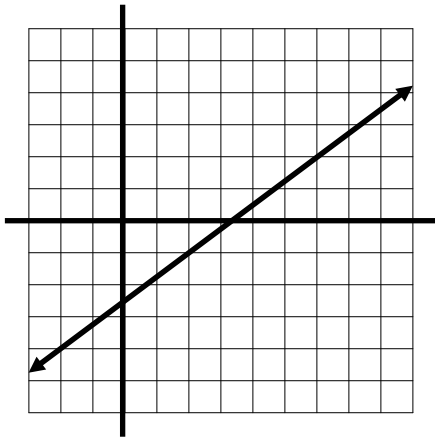
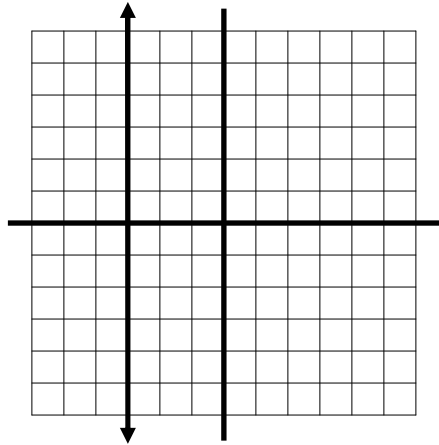
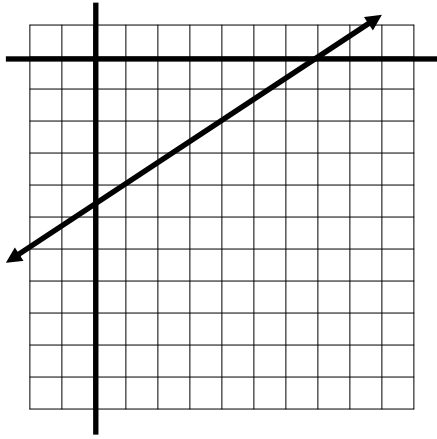
$$2x - 5y = 0$$

$$y$$

-2
 y -3
 x 4
 x -2
 y -5

$(2,3)$ x
 $(-3,4)$
 $(3,5)$
 $(3,3)$ y
 $(-2,2)$ x







$$m_1 m_2 = -1$$

$$m_2 = -\frac{1}{m_1}$$

$$(3, -4)$$

$$2x - 5y = 7$$

$$(3, -4)$$

$$2x - 5y = 7$$

$$2x - 5y = 7$$

$$2x - 5y = 7$$

$$-5y = -2x + 7$$

$$y = \frac{2}{5}x - \frac{7}{5}$$

$$2x$$

$$-5$$

$$\frac{2}{5}$$

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

$$b \quad y$$

$$(3, -4)$$

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

$$b$$

$$-4 = \frac{2}{5}(3) + b$$

$$b$$

$$b = -\frac{26}{5}$$

$$y = \frac{2}{5}x - \frac{26}{5}$$

(6,2)

$$y = \frac{3}{7}x + 1$$

(6,2)

$$y = \frac{3}{7}x + 1$$

$$y = \frac{3}{7}x + 1$$

$\frac{3}{7}$

$-\frac{7}{3}$

$\frac{3}{7}$

$$y = -\frac{7}{3}x + b$$

b

y

(6,2)

$$y = -\frac{7}{3}x + b$$

b

$$2 = -\frac{7}{3}(6) + b$$

b

$$b = 16$$

$$y = -\frac{7}{3}x + 16$$

(3,-2)

x

5

(0,-4)

(3,-2)

(5,0)

(0,-4)

(0,-4)

(5,0)

x

y

$$\text{slope} = \frac{\text{change in } y}{\text{change in } x} = \frac{4}{5}$$

$-\frac{5}{4}$

4

5

$$\begin{array}{l} (-1, -2) \quad (8, 1) \\ -1 \end{array}$$

$$(-2) \cdot \frac{1}{3} = -\frac{2}{3}$$

$$x - 4y = 6 \text{ and } -2x + 8y = 12$$

$$x + 3y = 9 \text{ and } -2x - 3y = 18$$

$$4x + 2y = 10 \text{ and } x - 2y = 4$$

$$3x - 4y = 12 \text{ and } 4x - 3y = 24$$

$$2x - 3y = 6 \text{ and } y = \frac{3}{2}x + 5$$

$$7x - 5y = 35 \text{ and } y = -\frac{5}{7}x$$

$$3x + 5y = 15 \text{ and } y = -\frac{3}{5}x + 7$$

$$8x - 3y = 0 \text{ and } y = -\frac{3}{8}x - 12$$

$$(-1, 4)$$

$$y = 3x - 2$$

$$(-2, 3)$$

$$y = 7$$

$$(-2, 3)$$

$$x = -5$$

$$(2, 1)$$

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

$$2x + 3y$$

$$x \quad -5$$

(4,3)

$$x+3y+1=0$$

(-1,-3)

$$-5x+3y-15=0$$

$(-3, -1)$ $(3, 3)$ $(-9, 8)$

$$2(-3)^2 + (-3) - 15 = 18 - 3 - 15 = 0$$

$$q > 0$$

$$(x - p)^2 = q$$

$$ax^2 + bx + c = 0 \quad D = b^2 - 4ac$$

$$D > 0$$

$$D = 0$$

$$D < 0$$

$$x = \frac{1+5}{4} \quad \text{or} \quad x = \frac{1-5}{4} \quad + \quad -$$

$$x = \frac{3}{2} \quad x = -1$$

$$a = 4 \quad b = -12 \quad c = 9$$

$$D = b^2 - 4ac$$

$$D = (-12)^2 - 4(4)(9)$$

$$x^2 + 3x - 10 = 0$$

$$(x+5)(x-2) = 0$$

$$x+5=0 \text{ or } x-2=0$$

$$x=-5 \text{ or } x=2$$

$$x = -5 \quad x = 2$$

$$a=1 \quad b=3 \quad c=-10$$

$$x = \frac{-3 \pm \sqrt{3^2 - 4(1)(-10)}}{2(1)}$$

$$a=1 \quad b=$$

$$(x-5)^2 = 2$$

$$x^2 = 6x - 9$$

$$\left(x - \frac{3}{2}\right)^2 - \frac{1}{4} = 0$$

$$3x^2 - 5x - 1 = 0$$

$$4x^2 - x - 5 = 0$$

$$(x+2)^2 + 4 = 0$$

$$x^2 + 8 = 0$$

$$3x^2 - 13x - 10 = 0$$

$$x^2 + x = 2$$

$$2x^2 - x - \frac{1}{2} = 0$$

$$4(x+1)^2 = 3$$

$$x^2 - 2x - 35 = 0$$

(x)

$$x^2 + 6x + 9 = 7 + 9$$

$$\left(\frac{6}{2}\right)^2 = 9$$

9	9 $x^2 + 6x$ $x^2 + 6x$
-----	---------------------------------

$$(x+3)^2 = 16$$

$$x+3=4 \text{ or } x+3=$$

$$x^2 + 6x + 9 = (x+3)^2$$

$$x^2 + 2x + 5 = 0$$

(x

$$y = ax^2 + bx + c \quad a \neq 0 \quad b \quad c \quad x \quad y$$

(x, y)

I

$$x=0 \quad y=2(x-$$

$$\begin{aligned}
& -x^2 + 4x \\
& = -(x^2 - 4x) && -1 \\
& = -(x^2 - 4x + 4 - 4) && \left(\frac{-4}{2}\right)^2 = 4 \\
& = -((x-2)^2 - 4) && x^2 - 4x + 4 = (x-2)^2 \\
& = -(x-2)^2 + 4 && -1
\end{aligned}$$

$$-x^2 + 4x \quad -(x-2)^2 + 4 \quad y = -x^2 + 4x + 5$$

$$y = (-x^2 + 4x) + 5$$

$$x = -1 \quad x = 5$$

$$-(x-2)^2 + 9 = 0$$

$$-(x-2)^2 + 9 = 0$$

$$(x-2)^2 = 9$$

$$x-2 = 3 \quad \text{or} \quad x-2 = -3$$

$$x = 5 \quad \text{or} \quad x = -1$$

9

-1

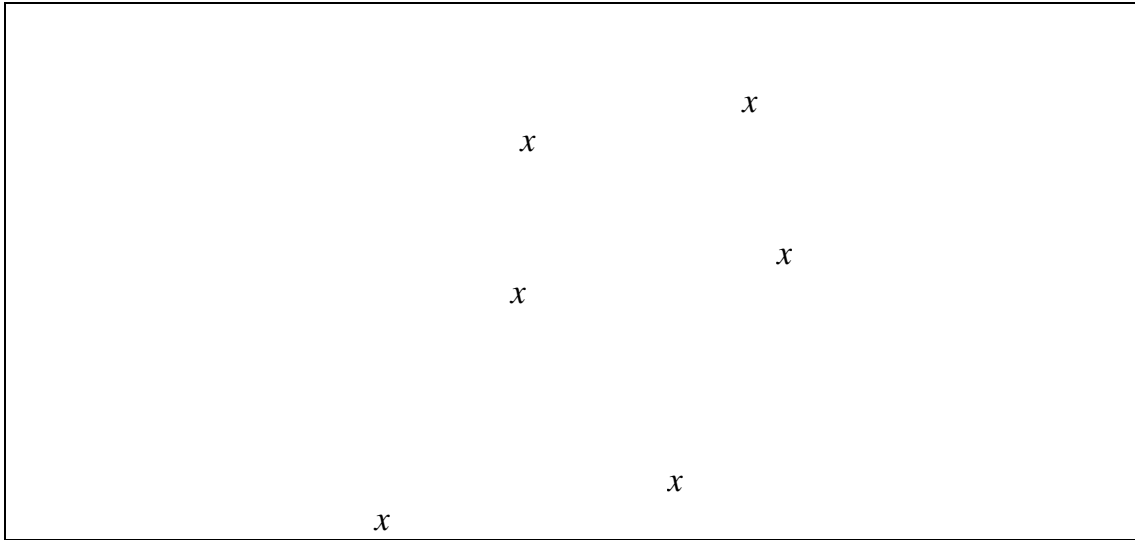
$$y = -\frac{1}{2}\left(x + \frac{3}{2}\right)^2 + \frac{15}{8}$$

$$y = \left(x - \frac{5}{2}\right)^2 - \frac{9}{4}$$

$$y = 4(x+1)^2 - 8$$

$$y = \frac{1}{2}\left(x - \frac{3}{2}\right)^2 - \frac{25}{8}$$

x



x

x

$x+3$

x

$x(x+3)$

$$2.50 \frac{\text{dollars}}{\text{ft}^2} \times x(x+3) \text{ ft}^2 = 2.50x(x+3) \text{ dollars}$$

$$2x + y = 7 \quad x + 2y = 2$$

(x, y)

(x, y)

$$x = 4 \quad y = -1$$

$$x = 4 \quad y = -1$$

$$x = 4 \quad y = -1$$

$$3(2)+4(-$$

$7x+$

$$y=3$$

3

$$y=3$$

$$x-2y=-4 \quad -3x+6y=12$$

-3

(x,y)

$$x+2y=5$$
$$y=2x+1$$

$$x=3y-7$$
$$x=-y+1$$

$$x-y=3$$
$$3x+y=5$$

$$2x+y=5$$
$$-x+3y=8$$

$$2x+3y=10$$
$$2x+y=-6$$

$$2x+4y=-9$$

x4333

$$3x+2y=0$$
$$x=y-5$$

$$y=2x-3$$
$$y=-3x+17$$

$$x+y=8$$
$$3x-2y=-1$$

$$3x+4y=1$$
$$2x-y=19$$

$$3x+2y=5$$
$$x+y=4$$

$$2x+3y=-1$$

$$4x+2y=2$$

$$5x-3y=0$$

$$3x+y=14$$

$$3x-2y=4$$

$$5x-3y=7$$

$$4x-3y=5$$

$$2x+6y=5$$

$$3x-4y=6$$

$$-9x+5y=-18$$

$$x+5y=1$$

$$x-3y=9$$

$$2x+3y=12$$

$$7x-5y=11$$

$$4x-10y=-1$$

$$8x+5y=8$$

Tm Tj T Q Q q

m

l

$$x+y=3$$

$$2x-y=0$$

$$y=x+3$$

$$y=2x-1$$

$$2x-3y=9$$

$$x+2y=1$$

$$2x+y=-1$$

$$x-2y=-8$$

$$f(x) = \frac{x^2}{x^3 + 1}$$

$$x = -2, 0, 1, 2, 3$$

f

1

f

x

$$\frac{x^2}{x^3 + 1}$$

$$f(-2) = \frac{(-2)^2}{(-$$

$$\{x \in \mathbb{R} : x \neq -1\}$$
$$x \neq -1$$

$$x \in \mathbb{R}$$

f

$$\text{Domain}(f) = (-\infty, -1) \cup (-1, \infty)$$

$$-1 \quad (-1, \infty)$$

$$(-\infty, -1)$$

$$-1$$

$$x \geq \frac{3}{2}$$

2

f

$$\text{Domain}(f) = x \in \mathbb{R} : x \geq$$

$$f(x) = \sqrt{2x+1} \quad x = -\frac{1}{2}, 0, \frac{1}{2}, \frac{3}{2}, \frac{5}{2}, 4$$

$$f(x) = \frac{x^2-1}{x^2+1} \quad x = -2, -1, 0, 1, 2$$

$$f(x) = \sqrt{x^2+x-2} \quad x = -5, -3, -2, 1, 2, 5$$

$$f(x) = x + \frac{1}{x^2+1} \quad x = -2, -1, 0, 1, 2$$

$$f(x) = \frac{1}{2x+1} + \frac{1}{2x-1}$$

f

$\text{Domain}(f) = -$

$$\frac{2}{x+1} + \frac{1}{x-1} = \frac{5}{x^2-1}$$

$$|3x+5|=8$$

$$8 \quad -8$$

$$\begin{array}{ccc} & & 8 \\ & 3x+5 & \\ 3x+5=8 & & 3x+5=-8 \end{array} \quad 8 \quad -8$$

$$3x+5=8$$

$$3x=3$$

$$x$$

$$5$$

$$4\sqrt{7-3x}=12$$

$$|9-2x|=7$$

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

$$\frac{2}{x-1} + \frac{1}{x^2+x-2} = \frac{1}{x+2}$$

$$\sqrt{|2x+6|}=4$$

