SPARKERA

SPARK YOUR CHILD'S CURIOSITY

MATHS ASSIGNMENTS

LEVEL:- High School

Name……

Date……

Time……To……

Solve:

$$1\frac{1}{13} - 2\frac{2}{13} =$$

$$-2\frac{2}{13} + 1\frac{1}{13} =$$

$$-1\frac{1}{13} + 2\frac{2}{13} =$$

$$-1\frac{1}{13} - 2\frac{2}{13} =$$

$$-2\frac{2}{13} - 1\frac{1}{13} =$$

$$2\frac{2}{13} + 1\frac{1}{13} =$$

$$\frac{1}{5} - 2 =$$

$$-\frac{1}{5} - 2 =$$

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◆ Calculate.

(1) $6^3 \div 2^3 \div 4^2 = \dfrac{6 \cdot 6 \cdot 6}{2 \cdot 2 \cdot 2 \cdot 4 \cdot 4} =$

(2) $6^5 \div 4^3 \div 3^3 =$

(3) $10^2 \div 2^4 \div 5^3 =$

(4) $9^4 \div 6^2 \div 3^2 \times 4^2 =$

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Simplify

1) $4x - 10 = 2x + 2$

2) $4(3 - x) = 8$

3) $3x - (x - 5) = 9$

4) $7 - (4x - 5) = 22$

3) $8 - (3x - 4) = 21$

1) $\frac{x}{4} - \frac{2x-10}{5} = 3$

2) $\frac{2x}{5} + \frac{5x+3}{2} = = \frac{3x+7}{4}$

3) $\frac{x-3}{3} + \frac{4x}{4} = = \frac{3x}{4} + \frac{x}{5}$

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Solve the following equations.

1. $x = y - 3$
   $x + 4y = 7$

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

Solve the following equation

1. $$\frac{1}{x}+\frac{1}{y}-\frac{1}{z}=3$$
$$\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=5$$
$$-\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=7$$

2. $$x + y - z + w = 10$$
$$x + 3y - 4z + 5w = 26$$
$$x + 4y - 7z + 7w = 37$$
$$x + 2y - 3z + 6w = 22$$

Form three equations with x eliminated.

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Factorize:

$4x^2 + 4x + 1$

$25x^2 - (x + 2y + 4z)^2 =$

$(3x - y)^2 - (5x - 3y)^2 =$

$x^2 - y^2 - x - y$

$4a^2 + 12ab + 9b^2 - 25x^2$

$81(x + y)^2 - 16(x - y)^2$

1. $\frac{3\sqrt{2}}{2\sqrt{3}} - 2\sqrt{6} =$

2. $\frac{5}{2\sqrt{3}} - \sqrt{3} =$

3. $\frac{2\sqrt{3}}{3\sqrt{8}} + \frac{\sqrt{6}}{3} =$

4. $\sqrt{\frac{1}{20}} + \frac{\sqrt{5}}{5} =$

5. $\sqrt{\frac{3}{5}} - \sqrt{\frac{3}{20}} =$

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Solve the following equations :

$x^2 - 7x + 10 = 0$

$x^2 + 4x + 3 = 0$

$x^2 + 5x - 6 = 0$

$x^2 + 2x - 15 = 0$

$x^2 + 2x - 8 = 0$

$x^2 - 6x = 0$

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Factorize the following exercise.

1. $(x + y)^2 + 3(x + y) - 18 =$

2. $(x + y)^2 - 7(x + y) + 10 =$

3. $(x + 2)^2 - 9(x + 2) + 20 =$

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.Read the example given below and find the vertex of the given quadratic functions and then plot its graph.

$y = x^2 + 6x + 13$

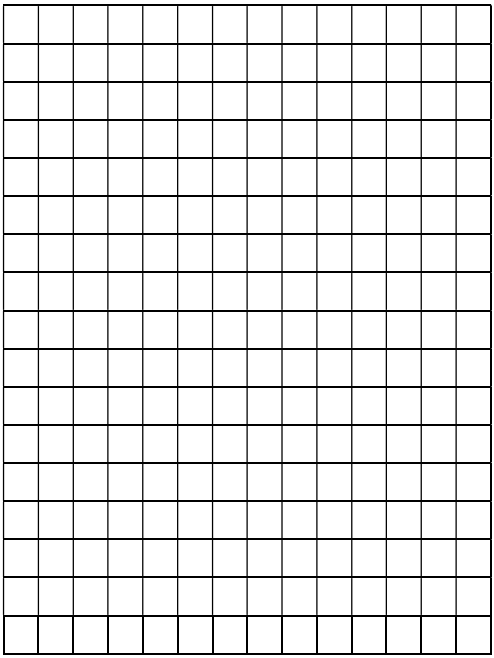
$y = (x + 3)^2 - 9 + 13$

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

Vertex $(-3, 4)$

$y = x^2 + 4x + 6$

x	y
1	
0	
−1	
−2	
−3	
−4	
−5	



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1. Find the quadratic equation with the two given roots.

(1) $\frac{2+\sqrt{5}}{3}$, $\frac{2-\sqrt{5}}{3}$

(2) $\frac{-1+\sqrt{3}\,i}{2}$, $\frac{-1-\sqrt{3}\,i}{2}$

2. Given that $x^2+5x-1=0$ has 2 roots α and β, evaluate the following expressions.

(1) $\alpha^2-\alpha\beta+\beta^2$

(2) $(\alpha-2\beta)(2\alpha-\beta)$

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Find the axis of symmetry and the vertex for each parabola:

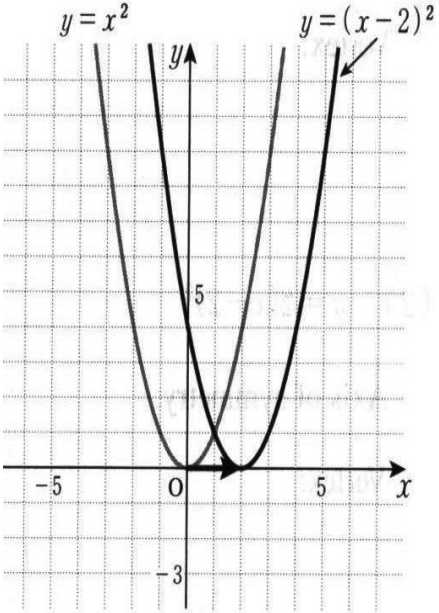
$y = (x – 2)^2$

Axis of Symmetry:

_____

Vertex:

The graph of $y = (x – 2)^2$ is a a translation of $y = x^2$, 2 units along the x – axis
the x - axis

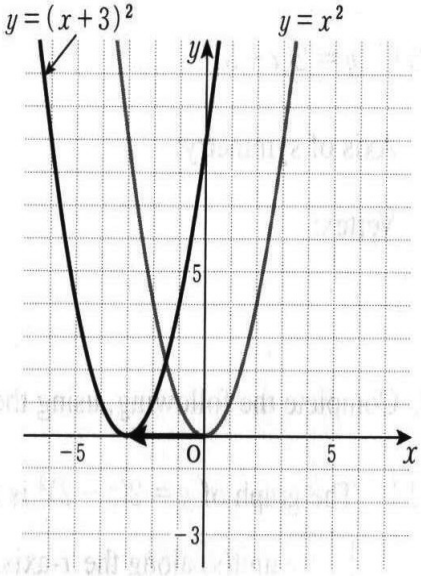


$y = (x + 3)^2$

Axis of Symmetry: x =

Vertex: _____

The graph of y = _____ is translation of y = _____ _____ units along



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Read the example and solve the following equations. Mark each solution on the graph.

$2^x = 16$

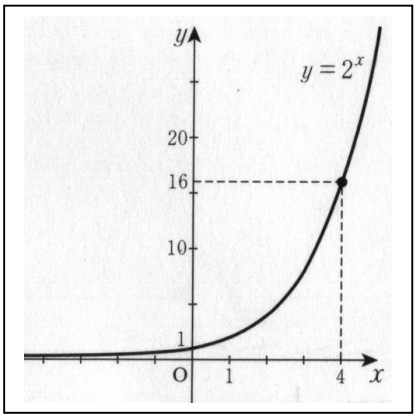
Let = $y = 2^x$

$16 = 2^x$

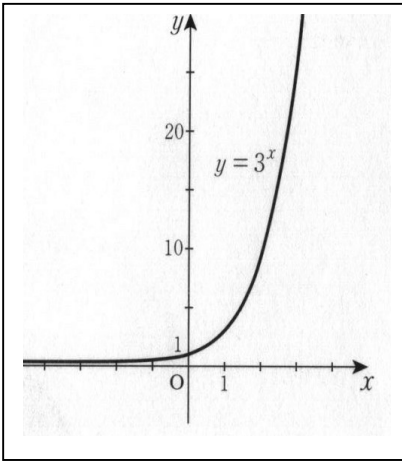
We know that $16 = 2^4$

$2^4 = 2^x$

Therefore, $x = 4$



1. $3^x = 27$



Evaluate the following:

1. $\dfrac{\cos 80°}{\sin 10°} + \operatorname{cosec} 31° \cos 59° =$

2. $\dfrac{2 \tan 53°}{\cot 37°} - \dfrac{\cot 80°}{\tan 10°} =$

Simplify the following identities:

1. $\tan^2\theta - \tan^2\theta \sin^2\theta = \sin^2\theta$

2. $\sin^4\theta - \cos^4\theta = 2 \sin^2\theta - 1 =$

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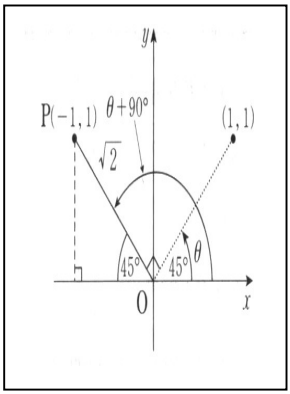
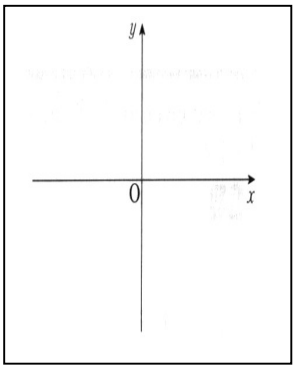
For each given angle θ, draw the diagram and find sin , cos and tan of θ and $\theta + 90°$

$\theta = 45°$



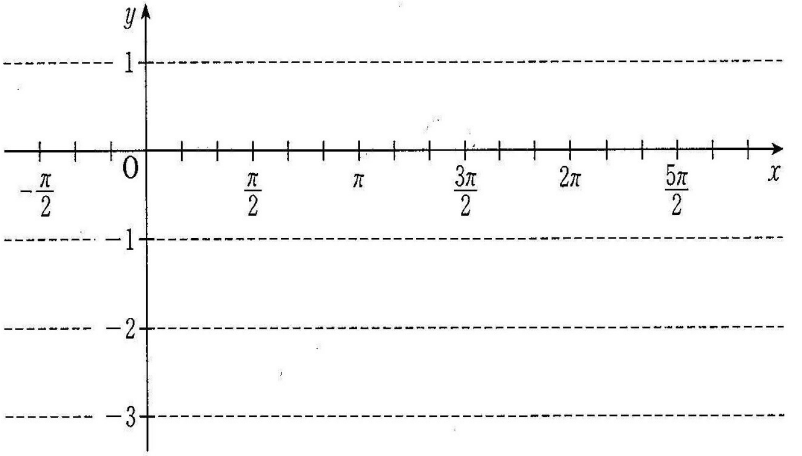
$\sin\ \theta =$	$\sin\ (\theta + 90°) =$
$\cos\ \theta =$	$\cos\ (\theta + 90°) =$
$\tan\ \theta =$	$\tan\ (\theta + 90°) =$

$\theta = 30°$



$\sin\ \theta =$	$\sin\ (\theta + 90°) =$
$\cos\ \theta =$	$\cos\ (\theta + 90°) =$
$\tan\ \theta =$	$\tan\ (\theta + 90°) =$

(3) $y = 2\cos\left(x - \frac{\pi}{4}\right) - 1$



The graph of $y = 2\cos\left(x - \frac{\pi}{4}\right) - 1$ is a translation of $y = 2\cos x$,

☐ unit(s) along the x-axis and ☐ unit(s) along the y-axis.

1. Find the equation of each given line.

(1) The line passing through point $(-4, 3)$ with gradient 2.

(2) The line passing through points $(-1, 3)$ and $(5, -6)$.

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Logarithmic Functions

Given that $\log_2 3 = a$ and $\log_3 7 = b$, write the following in terms of a and b.

Read the example and solve

$$\log_6 21 = \frac{\log_3 21}{\log_3 6} = \frac{1+\log_3 7}{\log_3 2+1} = \frac{1+\log_3 7}{\frac{1}{\log_2 3}+1} = \frac{1+b}{\frac{1}{a}+1} = \frac{a+ab}{1+a}$$

(1) $\log_7 2 =$

(2) $\log_{14} 56 =$

(3) $\log_{42} 28 =$

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Find y' of each given function.

(5) $y=\cos^3(1-2x^2)$

(6) $y=\dfrac{\cos x}{x}$

(7) $y=\dfrac{\cos x}{1+\cos x}$