Answer to the samples of the school book

Gemoetry

third grade prep

First Term2018

منتدى توجيه الرياضيات
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MODEL (1)

First: Choose the correct answer:

1. Tan 45° = ...

   A 1 B $2\sqrt{2}$ C $\frac{1}{2}$ D $\sqrt{2}$

2. If Sin x = $\frac{1}{2}$, X is an acute angle, then m (∠X) = ...

   A 4 B 60 C 30 D 90

3. The distance between the two points (3, 0) , (0, -4) = ...

   A 4 B 5 C 6 D 7

4. If X + y = 5 , Kx + 2y = 0 are perpendicular , than K = ...

   A -2 B -1 C 1 D 2

5. If A (5, 7) , B (1, -1) , then the mid-point $\overline{AB}$ is .....

   A (2, 3) B (3, 3) C (3, 2) D (3, 4)

6. The equation of the sraight line which passes through the point (3, -5) and parallel to Y-axis is.....

   A x= 3 B y = -5 C y = 2 D x = -5

Second:

A Whithout using calculator prove that sin 60° = 2 sin 30° Cos 30°

B Prove that the points A (-3, -1) , B (6, 5) , C(3, 3) are collinear

Third:

A If $4 \cos 60^\circ \sin 30^\circ = \tan x$. Find the value of x, then x is an acute angle.

B If the mid-point of $\overline{AB}$ is c(6, -4) then A (5, -3) Find the point B.

Fourth:

A If the straight line L_1 passes through the points (3, 1), (2, K) and the straight line L_2 makes with the positive direction of the x--axis anhgle of measure 45° . Find the value of K if $L_1 // L_2$

B ABC is a right angled triangle at , AC = 6cm , BC = 8cm find

First: Cos A cos B - sin A sin B .

Second: m ($\angle$ B).

Fifth:

A Find the equation of the straight line which slope is 2 and passes through the point (1, 0).

B Prove that the points A(3, -1) , B (-4, 6) , C (2, -2) which belong to an orthogonal certesian co-ordinates plane lie on the circle whose centre M(-1, 2) . Find the circumference of the circle.

ANSWER MODEL (1)

QUESTION (1)

(1) $\text{Tan}(45^\circ) = 1$

(2) $m(\angle x) = 30^\circ$

(3) $\sqrt{(3-0)^2 + (0+4)^2} = \sqrt{25} = 5$

(4) $\text{Slope}_1 = \frac{-1}{1}$, $\text{Slope}_2 = \frac{-k}{2}$ $\because L_1 \perp L_2$

$\therefore S_1 \times S_2 = -1$ $\therefore \frac{-1}{1} \times \frac{-k}{2} = -1$ $\therefore k = -2$

(5) $\left(\frac{x_1 + x_2}{2} , \frac{y_1 + y_2}{2}\right) = \left(\frac{5+1}{2} , \frac{7-1}{2}\right) = (3, 3)$

(6) $X = 3$

QUESTION (2)

(a) $\sin(60^\circ) = \frac{\sqrt{3}}{2}$

$2\sin(30^\circ)\cos(30^\circ) = 2 \times \frac{1}{2} \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$

$\therefore \sin(60^\circ) = 2\sin(30^\circ)\cos(30^\circ)$

(b) Slope $\overleftrightarrow{AB} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5+1}{6+3} = \frac{6}{9} = \frac{2}{3}$

Slope $\overleftrightarrow{BC} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3-5}{3-6} = \frac{-2}{-3} = \frac{2}{3}$

$\therefore$ Slope of $\overleftrightarrow{AB}$ = Slope of $\overleftrightarrow{BC}$ $\therefore$ A,B,C are collinear

QUESTION (3)

(a) $\tan(x) = 4\cos(60^\circ)\sin(30^\circ)$

$= 4 \times \frac{1}{2} \times \frac{1}{2} = 1$

$\tan(x) = 1$ $\therefore m(\angle x) = 45^\circ$

(b) Let B = (x , y)

$\frac{x+5}{2} = 6 \Rightarrow x + 5 = 12 \quad \therefore x = 7$

$\frac{y-3}{2} = 6 \Rightarrow y - 3 = -8 \quad \therefore y = -5$

$\therefore$ B (7 , – 5)

QUESTION (4)

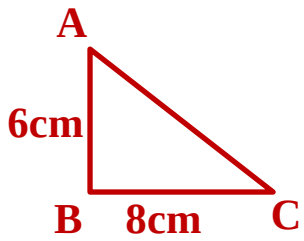
(a) $S_1 = \frac{k-1}{2-3} = \frac{k-1}{-1} = -k + 1$

$S_2 = \tan(45^\circ) = 1$

$\because L_1 \parallel L_2 \Rightarrow S_1 = S_2 \Rightarrow -k + 1 = 1 \quad \therefore k = \text{zero}$

(b) ABC is a right-angled triangle at C

$\therefore AB = \sqrt{(AC)^2 + (BC)^2} = \sqrt{36 + 64} = 10\text{cm}$



(1) $\cos A \cos B - \sin A \sin B$

$= \frac{6}{10} \times \frac{8}{10} - \frac{8}{10} \times \frac{6}{10} = \text{zero}$

(2) $\text{Sin } B = \frac{6}{10} = 0{,}6$ shift sin 0,6 = ,,,,

$M(\angle B) = 36^\circ \; 52' \; 11''$

QUESTION (5)

(a) $Y = m x + c = 2x + c \quad (4 , 0) \in$ the straight line

$\therefore 0 = 2 \times 1 + c \Rightarrow c = -2$

The equation 0f straight line $y = 2x - 2$

(B) $MA = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{(-1-3)^2 + (2+1)^2} = 5$ l.u

$MB = \sqrt{(-1+4)^2 + (2-6)^2} = \sqrt{9 + 16} = 5$ l.u

$MC = \sqrt{(-1-2)^2 + (2+2)^2} = \sqrt{9 + 16} = 5$ l.u

$\therefore MA = MB = MC = 5$ L.U $\Rightarrow$ A,B,C lies on the circle

circumference of a circle $= 2\pi r = 2\pi \times 5 = 10\pi$ L.U

MODEL (2)

First: Choose the correct answer:

1) $2 \sin 30^\circ \tan 60^\circ =$ .....:

A $\sqrt{3}$ B 3 C $\frac{\sqrt{3}}{3}$ D $\frac{1}{2}$

2) The equation of the straight line which passes through the point (-2,-3) and parallel to x-axis is ..... .

A $x = -2$ B $x = -3$ C $y = -2$ D $y = -3$

3) If $\cos x = \frac{\sqrt{3}}{2}$, X is acute angle , then $\sin 2x$ = ...

A 1 B $\frac{\sqrt{3}}{2}$ C -2 D $\frac{1}{\sqrt{3}}$

4) A circle of centre at the origin point and its redius is 2 unit length which of the following points belongs to the circle ?

A (1,-2) B $(-2,\sqrt{5})$ C $(\sqrt{3},1)$ D (0,1)

5) The perpendicular distance between the two straight lines $x - 2 = 0$, $x + 3 = 0$ equals .....

A 1 B 5 C 2 D 3

6) If $\frac{-3}{2}$, $\frac{6}{k}$ are the slopes of two parallel straight lines then k = ...

A 6 B -4 C $\frac{3}{2}$ D 2

Second:

A If $\cos E \tan 30^\circ = \cos^2 45^\circ$ find $m(\angle E)$, E is a cute angle

B Show the type of the triangle whose vertices A(3,3) m B (1, 5) , C(1, 3) due to its side lengths.

Third:

A Find the equation of straight line which passes through the points (1, 3) , (-1, -3) and prove that it is passing through the origin point.

B If the point (3, 1) is the mid-point of (1, y) , (x, 3) find the point of (x, y).

Fourth:

A Find the equation of the straight line which intercepts two axes . Two positive parts of length 1 and 4 for x and y axes respectively and find its slope

B ABC is a right - angled triangle at B AC = 10cm BC = 8cm , prove that $\sin^2 A + 1 = 2\cos^2 C + \cos^2 A$

Fifth:

A prove that the straight line which passes through the points (-1, 3) , (2, 4) parallel to the straight line 3y - X - 1 = 0

B ABCD is a trapezium , $\overline{AD}$ // $\overline{BC}$ $m(\angle B) = 90°$, AB = 3cm , BC = 6cm , AD = 2cm . Find the length of $\overline{DC}$ and the value of $\cos \angle BCD$

ANSWER MODEL (2)

QUESTION (1)

(1) $2 \times \frac{1}{2} \times \sqrt{3} = \sqrt{3}$

(2) $y = -3$

(3) $\cos(x) = \frac{\sqrt{3}}{2} \Rightarrow m(\angle x) = 30^\circ \quad \therefore \sin(2x) = \sin 60 = \frac{\sqrt{3}}{2}$

(4) $(\sqrt{3}, 1)$ becouse $\sqrt{(\sqrt{3})^2 + (1)^2} = 2$

(5) $|2| + |-3| = 5$ L.U

(6) $L_1 // L_2 \Rightarrow m_1 = m_2 \Rightarrow \frac{-3}{2} = \frac{6}{k} \quad \therefore k = \frac{6 \times 2}{-3} = -4$

QUESTION (2)

(a) $\cos(E) \times \frac{1}{\sqrt{3}} = \left(\frac{1}{\sqrt{2}}\right)^2 = \frac{1}{2}$

$\cos(E) = \frac{1}{2} \times \sqrt{3} = \frac{\sqrt{3}}{2}$

shift cos $\left(\frac{\sqrt{3}}{2}\right)$ = ,,, $\Rightarrow m(\angle E) = 30^\circ$

(b) $AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{(1-3)^2 + (5-3)^2} = 2\sqrt{2}$

$BC = \sqrt{(1-1)^2 + (3-5)^2} = \sqrt{0+4} = 2$ L.U

$AC = \sqrt{(1-3)^2 + (3-3)^2} = \sqrt{4+0} = 2$ L.U

$\therefore$ AC = BC $\Rightarrow \Delta$ ABC is isosceles triangle

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QUESTION (3)

(a) Slope $= \frac{y_1 - y_2}{x_1 - x_2} = \frac{-3-3}{-1-1} = \frac{-6}{-2} = 3$

$Y = m x + c = 3x + c$ $\quad (1, 3) \in$ the straight line

$\therefore$ $3 = 3\times 1 + c \Rightarrow c = 0$

The equation 0f straight line $y = 3x$

$0 = 3\times 0$ the straight line passing through the point (0,0)

(b) $(3, 1) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right) = \left(\frac{1+x}{2}, \frac{3+y}{2}\right)$

$3 = \frac{1+x}{2} \Rightarrow 1 + x = 6 \quad \therefore x = 5$

$1 = \frac{3+y}{2} \Rightarrow 3 + y = 2 \quad \therefore y = -1 \quad \therefore (x, y) = (5, -1)$

QUESTION (4)

(a) $\frac{x}{A} + \frac{y}{B} = c \quad \Rightarrow \quad \frac{x}{1} + \frac{y}{4} = c$

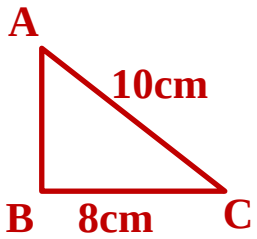
$\therefore$ Slope $= \frac{B}{A} = \frac{4}{1} = 4$, $(1 , 0) \in$ the straight line

$\frac{1}{1} + \frac{4}{0} = c \quad \Rightarrow \quad c = 1$

The equation $x + \frac{y}{4} = 1 \quad \Rightarrow \quad 4x + y = 4$

(b) $\because \Delta ABC$ is aright angled triangle at B

$\therefore AB = \sqrt{(AC)^2 - (BC)^2} = \sqrt{100 - 64} = 6$ cm



$\sin^2 A + 1 = \frac{64}{100} + 1 = \frac{164}{100}$ - - - - (1)

$2\cos^2 C + \cos^2 A = 2 \times \frac{64}{100} + \frac{36}{100}$

$= \frac{128}{100} + \frac{36}{100} = \frac{164}{100}$ - - - - - (2)

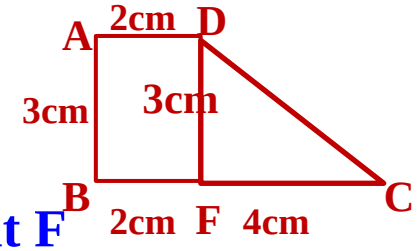
From (1) & (2) $\therefore \sin^2 A + 1 = 2\cos^2 C + \cos^2 A$

QUESTION (5)

(a) $\therefore$ Slope (1) $= \frac{4-3}{2+1} = \frac{1}{3}$, Slope (2) $= \frac{-(-1)}{3} = \frac{1}{3}$

Slope (1) = Slope (2) $\therefore$ the two straight lines are parallel

(b) AB = DF = 3cm , AD = BF = 2cm



FC = 6 – 2 = 4cm

$\because \Delta DFC$ is aright angled triangle at F

$\therefore DC = \sqrt{(DF)^2 + (FC)^2} = \sqrt{9 - 16} = 5$ cm

Cos ($\angle BCD$) $= \frac{FC}{DC} = \frac{4}{5}$

للطلاب المدمجين MODEL (3)

First: Put (✓) or (✗): (For the special needs)

1. The distance between the point (9,0), (4,0) = 5 (✓)
2. If Tan E = 1 , then: m (∠ E) = 45° (✓)
3. The straight line $y = 2x+1$ intercepts a part of length - 1 for y - axis (X)
4. If $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$, then the slope of $\overleftrightarrow{AB}$ × The slope of $\overleftrightarrow{CD}$ = 1 (both of $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ aren`t parallal any axes) (X)
5. $\tan 60^\circ = \frac{1}{\sqrt{3}}$ (X)
6. If A (1, 2) , B (3,4) , then the coordinates of the midpoint of $\overline{AB}$ is (2, 3) (✓)

Second: Choose the correct answer form given:

1. The distance between the point (4,3) and x - axis is **3**

   A -3 **B 3** C 4 D -4

2. 4 cos 30° Tan 60° = **6**

   A 3 B $2\sqrt{3}$ **C 6** D 12

3. If X + y = 5 , kx + 2y = 0 are parallel , than k **= - 2**

   A -2 B -1 C 1 D 2

4. The points (0,1) , (3, 0), (0, 4) .....

   A from a right angled triangle B from a acute angled triangle

   C from an obtuse angled triangle D are collinear

5. If $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$ and the slope of $\overleftrightarrow{AB} = \frac{2}{3}$, then the slope of $\overleftrightarrow{CD}$ = **$\frac{2}{3}$**

   A $\frac{2}{3}$ B $\frac{3}{2}$ C $\frac{-2}{3}$ D $\frac{-3}{2}$

6. If $\sin x = \frac{1}{2}$, x acute angle, then sin 2x = ...

   A 1 B $\frac{1}{4}$ **C $\frac{\sqrt{3}}{2}$** D $\frac{1}{\sqrt{3}}$

Third: Join From column (A) to column (B):

A	B
1 The slope of the straight line which parallel to x - axis is ..0....	● 10
2 $\sin^2 30^\circ + \cos^2 30^\circ$ = ..1.....	● 0
3 If ABCD is a rectangle A (-1, -4) , C (5, 4) then the length of $\overline{BD}$ = ..10.. unit lenght	● 1
4 The equation of the straight line which passes through the origin point and its slope is 2 is Y = ...2..... x	● -3
5 The equation of the straight Line which passes through the point (2, -3) , parallel x - axis y = ..-3..	● 2
6 The value of $\frac{2\tan 30^\circ}{1+\tan^2 30^\circ}$ = ..$\frac{\sqrt{3}}{2}$...	● $\frac{\sqrt{3}}{2}$

Fourth: Complete the following

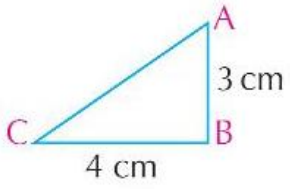
1 If $\overline{AB}$ // $\overline{CD}$ and the slope of $\overline{AB}$ = $\frac{1}{2}$, then

The slope of $\overline{CD}$ = $\frac{1}{2}$

2 The opposite figure: ..... s a right angle

at B, AB = 3 cm , BC = 4cm, then

Sin C = $\frac{5}{3}$



3 If the point (0, a) belongs to straight line

3x - 4y = -12 , then a = 3

4 If X cos 60° = tan 45°, then x = 2

5 The distance between the point (4, 3) and the origin point in the coorinate plane = 5

6 If the origin point is the mid - point of $\overline{AB}$, A(5, -2), then B (-5 , 2)