**2021 MARKING SCHEME**

1. -2(5 + 3) - 9 $÷$3 + 5 = - 14$√√$

 -3 x -5 + (-2) x 4 7

 = -2 $√$

1. LCM of 9, 15 and 21

 32 x 5 x 7 = 315 minutes$√$

 Last time ringing together

 11.00 2300

 5.15 515

 5.45 p.m. $√$ 1745hrs$√$

1. let a technician be x and artisan be y

 3x + 2y = 9000

 4x + 1y = 9500

 8x+2y = 19000

 3x +2y = 9000

 $\frac{5x}{5}$ = $\frac{10000}{5}$ = 2000..........................$√$

 Hiring a technician = 2000$√$

 Hiring artisan

 4(2000) + y = 9500

 Y= 1500

 2(2000) + 5(1500) = 11,500$√$

1. a) sh 77.24 x 100,000$√$

 = sh 7,724,00$√$

 b) Sh 77.24 x 100 000

 = 63172$√$

 122.27$√$

1. 3x + (x-20) = 1800

 4x = 2000

 X = 500$√$

 (x-20)n=360

 30n=360$√$

 n = 12 $√$

1. $\frac{243^{- \frac{2}{5}} × 125 ^{\frac{2}{3}}}{9^{- \frac{3}{2}}}$ = $\frac{3^{-2} × 5^{2}}{3^{-3}}√$

 = $\frac{27 × 25}{9}√$

 = 75 $√$

1. let mother’s year be x and son’s be y now:

 X+14=2(y+14) .................................(i)

 X+14= 2y+ 28

 x-2y = 14...........................................(ii)$ √$

 (x-4)+(y-4) =30

 X+y=38 ............................................(iii)$ √$

 (iii)-(ii)

 X+y=38

 -x+2=-14

 3y=24

 Y=24 x=30$√$

At son’s birth: mother’s age

30-8=22 $√$

1. Sin (x + 600) = cos 2x

 X + 60 + 2x = 900

 3x = 30$√$

 x = 100

 Tan (10 + 60)0 = tan 700$√$

 2.748(4.S.F) from tables $√$

1. 2$π$r2 + 2$π$rh = 154

 r = h

 2$π$r3 + 2$π$r2 = 154$√$

 4$π$r2 = 154

 r = $\sqrt{\frac{154}{4 ×3.142}}√$

 = 3.500

 diameter = 2r= 3.500 x 2

 = 7.00 (s dp) $√$

1. Volume of plate = 1.05 x 100$√$

 8.4

 = 125cm3

 $L^{2}=\frac{125 cm}{0.2}=625$ $√$

 L = $\sqrt{625}$ = 25cm $√$

1. $\frac{a\left(a-b\right)\left(a+b\right)}{2\left(a+b\right) \left(a-b\right)}$

 $\frac{a^{2}-ba+ba+b^{2}}{\left(2a+2b\right) \left(a-b\right)}√$

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

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

 $\frac{a^{2}+ b^{2}}{2\left(a^{2}- b^{2}\right)} $ $√$

1. From 0700h Monday to 1900h Wednesday

 = 24 x 2 + 12 h

 =60h$√$

 Time lost = 60 x 15 = 900 sec

 =15 min$√$

 Time shown on clock:

 1900 h – 15 min = 1845 h$√$

 $\sqrt[3]{1728}$ = 12$√$

?

12

12

 $\sqrt{12^{2}+12^{2}}$

 =$\sqrt{288}$ =16.97 cm$√$

1. a) x-5$\leq $3x - 8

 -2x$\leq $-3$√$

 3x - 8 $<$ 2x -3

 x$<$5

 $∴$ 1.5 $\leq $ x $<$5$√$

0

1

2

3

4

5

6

b)

 $√$

1. $\left(\frac{3}{-2}\right)-\left(\frac{2}{3}\right)$ $√$

 = $\left(\frac{1}{-5}\right)$

 Magnitude = $\sqrt{1^{2}+\left(-5\right)^{2}}$ $√$

 = $\sqrt{26} $≈ 5.1 $√$

1. (a) mode

 =22$√$

 (b) Median

 15,15,16,19,19,20,20,21,22,22,22,26 ,27,28

 Median = $\frac{20+21}{2}$ $√$

 = 20.5 $√$

1. a) mass after decrease

 112 x $\frac{15}{16}$

 = 105 kg$√$

 Total decrease

 (112-105) x 540$√$

 =3780 kg$√$

 b) (i) no. of 90kg bags

 $\frac{105 x 540}{90}$ $√$

 =630

 Least number of trips

 $\frac{630}{120}√$

 = 5.25

 6 trips$√$

 ii) Expenses

 Buying price = 1500 x 630 = 945000$√$

 Transport = 1500 x 630 = 945000

 Total 945000 + 15000$√$

 Selling price per bag:

 = $\frac{960000 x 1.26}{630}$ = 1920$√√$

1. a) 10.5x100x6x100=630,000cm3

 Area of the tile = 30x30 = 900 cm2$√$

 No of tiles = $\frac{area of the floor }{area of one tile}$

 = $\frac{630000}{900}$ =700 tiles$√$

b) i) 1 carton = 20 tiles

 ? = 700 tiles

 $\frac{700 x 1}{20}$ =35 cartons.$ √$

 1 carton = 800 sh.

 35 Cartons = $\frac{35 x 800}{1}$ = 28,000sh$√$

 1 room =28,000 sh.

 15 rooms = $\frac{28000 x 15}{1}$ =420,000sh

 = sh. 420,000$√$

ii) Transport = 2000

 subsistence = 600

 2000 + 600 = 2600sh$√$

 Total cost = 420,000 +2600

 =Ksh. 422,600$√$

 $\frac{12.5}{100}$ x 422,600 = 52,825sh

 Profit = 52,825sh

 Cost price = 422,600sh

 Selling price = 422,600sh + 52,825$√$

 =475,425sh

 35 cartons = 475,245

 1 carton= 475425

 1 carton = $\frac{475,425 x 1}{35}$ 13,584sh$√√$

1. a)

b) i) Distance of P from s =10. 8 + 0.1cm

 ii) < PSN = 74 + 10$√$

 earing of P from S = 286 + 10

c) area of PQR = 1/2 x 10.2 x 12.2

 = 63.44km2

 Area of PRS = 1/2 x 10.2 x 2 sin-600

 = 30.6km2

Area of ranch PQRS

 = 62.22 + 30.6

 = 92.82km2

1.
2. Equation of L

 Gradient = $\frac{6-3}{-1--2}$

 =3

Equation = $\frac{y-6}{x+1}=3$

 =$y-3x=9√$

1. Equation of P$√$

= $\frac{y-6}{x+1}=-\frac{1}{3}$

 = 3y + x =17$√$

1. Equation of Q

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

= $y=3x-1√$

$x$ intercept

When $y$ = 0 $⇒ x$ = + $\frac{1}{3}$

$y$ intercept $√$

When $x$ = 0 $⇒ y$ = $-$1$√$

1. Intersection of lines P and Q

 $3y+x=17……\left(i\right)$

 $y-3x= -1…….\left(ii\right)$

 $3y+x=17√$

 $3y-9x=-3$

 $10x=20 ⇒x=2$

 Subset $3y+2=17⇒y=5$

 $∴point of intersection (2,5)$ $√$

1. 
2. a) i) $\frac{r}{9}$ = $\frac{4}{12}$

 R = $\frac{9x4}{12}$ = 3 cm

 ii) Volume of material drilled out

 = $\frac{1}{3}$ $π$ x $3^{2}x$ 4 = 12$π$

 b) Slant height of cone

 =$\sqrt{9^{2}+ 12^{2}}$ = 15 cm

 c) Surface area of solid after conical has been drilled

 $π $x 9 x 9 x 15 + $π$ x ($9^{2}- 3^{2}$) + $π$ x 3 x 5

 = $π$(135+72+15)

 = 222$π$

1. 15m/s
2. Maximum speed

$$\frac{1}{2}\left(15+h\right)×10+\frac{1}{2}\left(10+30\right)h=825$$

 $75+5h+20h=825$

 $25h=750$

 $h=30m/s$

1. (i) = $\frac{30-15}{10}$

 = 1.5m/s2

(ii) = $\frac{0-30}{20}$ = $-$1.5m/s2

1. $\left[\frac{1}{5}\left(15+30\right)×10+10×30\right]÷20$

= $\left(225+300\right)÷20$

 =26.25 m/s

1. (a) total sales = sh 360 x 500

 = sh.180,000$√$

 Commission

 = sh (180,000 – 100,000) x 2/3 $√$

 = 13600$√$

 (b) (i) New salary

 = sh.(12000 + 12000 x 10/100)$ √$

 = sh. 13200$√$

 Commission paid

 = Sh (17,600 -13,200)

 = Sh.4400$√$

 Commission is paid on sh.4400 x **100/2**

= 220,000$√$

 Total sales = sh.220,000 + 100,000 $√$

 =320,000/=$√$

(ii) No of handbags sold = $\frac{320,000}{500}$ = 640 $√$