Aptitude Questions & Answers, Explanations

Question 1.X can do a piece of work in 'p' days and Y can do the same work in 'q' days. Then the number of days in which X and Y can together do that work is

a. p+q/2

b. 1/p + 1/q

c. pq/p+q

d. pq

Ans. c.

Explanation: X's one day's work =1/p;

Y's one day's work =1/q;

(X + Y)'s day's work = 1/p + 1/q;

Hence, X and Y both can do that work = 1/(p+q/pq)=pq/(p+q).

Question 2.A shopkeeper marks his goods 40% above the cost price and allows a discount of 25% on it. His gain % is

a. 5%

b. 10%

c. 15%

d. 20%

Ans. 5%

Explanation: Marked price = 1.4*CP;

Discounted price = 0.75*1.4*CP= 1.05*CP;

% gain = (1.05CP-CP)*100/CP = 5%.

Question 3.The ratio of the ages of two boys is 3:4. After 3 years, the ratio will be 4:5.The ratio of their ages after 21 years will be

a. 14:17

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b. 17:19

c. 11:12

d. 10:11

Ans. 10:11

Explanation: Supoose Boy B1 = 3x and Boy B2 = 4x;

After 3 years,

(3x+3)/(4x+3) = 4/5; => x=3;

Boy B1's age = 9 years; Boy B2's age = 12 years;

The required age ratio = (9+21)/(12+21) = 30/33 = 10: 11

Question 4.The cost price of 25 books is equal to the selling price of 20 books. The profit percent is

a. 20%

b. 22%

c. 24%

d. 25%

Ans. 25%

Explanation: 25* CP = 20*SP;

% profit = (SP – CP)*100/CP = (SP/CP -1)*100 =(25/20 – 1)*100 = 25%.

Question 5.One number is 25% of another number. The larger number is 12 more than the smaller. The large number is

a. 48

b. 16

c. 4

d. 12

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Ans. 16

Explanation: 1st number = x; 2nd number= 0.25x;

x = 0.25x+12; => x = 12/0.75 = 16;

Question 6.A train 500 m long, running at a uniform speed, passes a station in 35 sec. If the length of the platform is 221 m, the speed of the train in km/hr is

a. 721/35

b. 74.16

c. 24.76

d. 78.54

Ans. 74.16

Explanation: Total distance traveled = 221 + 500 = 721 m;

Hence, the train's speed = 721/35 = 20.6 m/sec = 74.16 kmph.

Question 7.If the simple interest on Rs. 400 for 10 years is Rs. 280, then rate of interest per annum is

a. 7%

b. 7 ½ %

c. 7 ¼ %

d. 8 ½ %

Ans. 7%

Explanation: I = PRT/100;

R = 280*100/(400*10) = 7%.

Question 8.

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If a + b = 2c, then the value of $\frac{a}{a-c} + \frac{c}{b-c}$ *is equal to* (where $a \neq b \neq c$)

a. -1

b. 1

c. 0

d. 1/2

Ans. 1

Explanation: a + b = 2c; => a –c = -(b-c);

Putting these values in the problem equation-

a/(a-c) - c/(a-c) = (a –c) /(a-c) = 1;

Question 9.

If $x + \frac{1}{x} = 5$, then the value of $\frac{x}{1+x+x^2}$ is

a. 1/5

b. 1/6

c. 5

d. 6

Ans. 1/6

Explanation: $1 + x^2 = 5x$;

Plug this value in the problem-

= x/(x + 5x) = 1/6;

Question 10.G and AD are respectively the centroid and median of the triangle ΔABC.The ratio AG:AD is

a. 3:2

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b. 2:3

c. 2:1

d. 1:2

Ans. 2:3

Explanation: It is a triangle's property, if centroid of a triangle is located at the median then it will cut the median in 2:3 ratio.

Question 11.A point P lying inside a triangle is equidistant from the vertices of the triangle. Then the triangle has P as its

a. Centroid

b. Incentre

c. Orthocentre

d. Circumcentre

Ans. Circumcentre

Explanation: It is a property of triangle, if a point lying inside a triangle is equidistant from the vertices of the triangle, then this is called circumcentre.

Question 12.If sinθ + cosθ = 1, then the sinθ cosθ is equal to

a. 0

b. 1

c. ½

d. -½

Ans.

Explanation: sinθ + cosθ = 1;

Squaring both sides-

$Sin^2\theta + cos^2\theta + 2sin\theta cos\theta = 1$; => sinθ * cosθ =0;

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Question 13.If 7 times the seventh term of an Arithmetic Progression (AP) is equal to 11 times its eleventh term, then the 18th term of the AP will be

a. 1

b. 0

c. 2

d. -1

Ans.

Explanation: Let the first term of AP is a and uniform difference is d.

7*(a + 6d) = 11*(a + 10d);

11a – 7a +110d – 42d =0; => 4a + 68d=0; => a =-17d;

The 18^{th} term of AP = a + 17d = -17d + 17d =0;

Question 14.The average age of eight teachers in a school is 40 years. A teacher among them died at the age of 55 years whereas another teacher whose age was 39 years joins them. The average age of the teachers in the school now is (in years)-

a. 35

b. 36

c. 38

d. 39

Ans. 38

Explanation: Suppose the ages of eight teachers are A_1, A_2,……..,A_8;

A_1+ A_2+……..+A_8 =40*8 = 320;

After a teacher dies and joins another-

A_1+ A_2+……..+A_8 = 320 - 55 + 39 = 304;

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The required average = 304/8 = 38 years;

Question 15.

If $\frac{a^2}{b+c} = \frac{b^2}{c+a} = \frac{c^2}{a+b} = 1$ then find the value of $\frac{2}{1+a} + \frac{2}{1+b} + \frac{2}{1+c}$

a. 0

b. 1

c. 2

d. 3

Ans. 2

Explanation: $a^2 = b + c$; => $a^2 + a = a + b + c$; => $a(1+a) = a + b + c$; => $1/(1+a) = a/(a+b+c)$;

Similarly, $1/(1+b) = b/(a+b+c)$; and $1/(1+c) = c/(a+b+c)$;

Plugging these values in the given problem-

$2/(1+a) + 2/(1+b) + 2/(1+c) = 2[(a+b+c)/(a+b+c)] = 2$;

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Question 16.

$$If\ 2x+\frac{2}{x}=3, then\ the\ value\ of\ x^3+\frac{1}{x^3}+2\ is$$

a. 3/4

b. 4/5

c. 5/8

d. 7/8

Ans. 7/8

Explanation:

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

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

$$Plug\ the\ value\ x+\frac{1}{x}=\frac{3}{2};$$

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

$$=\frac{27}{8}-\frac{9}{2}+2=\frac{27-36}{8}+2=-\frac{9}{8}+2=\frac{7}{8};$$

Question 17.Two equal circles of radius 3 cm each and distance between their centres is 10 cm. The length of one of their transverse common tangent is

a. 7 cm

b. 9 cm

c. 10 cm

d. 8 cm

Ans. 8 cm

Explanation: $DE^2=GF^2=d^2-(\text{first radius + second radius})^2$;

$DE=GF=\sqrt{10^2-6^2}=8$ cms;

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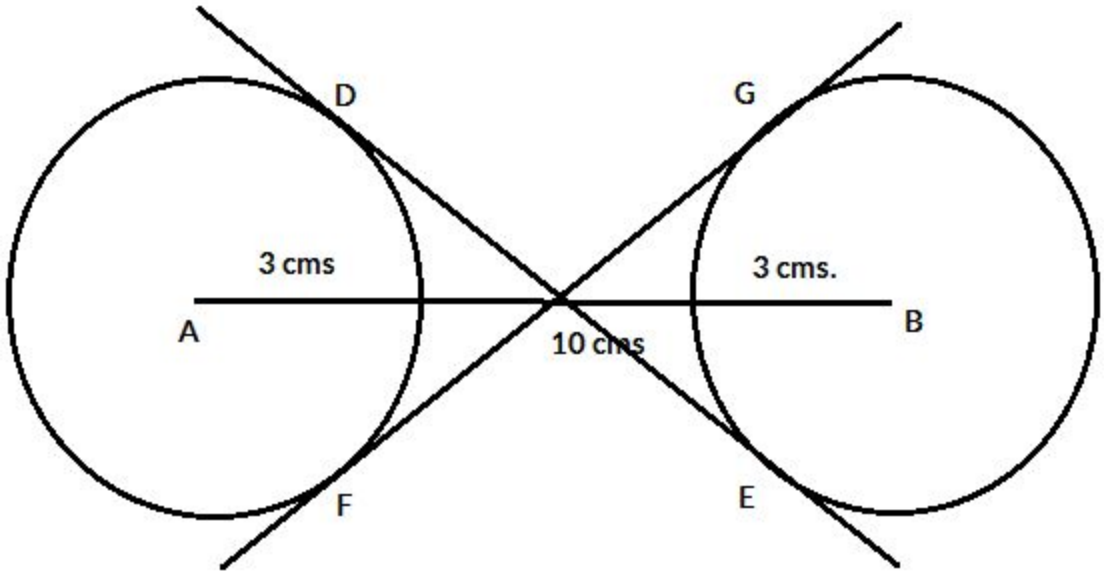

Question 18.

$$In\ \Delta ABC\ if\ the\ median\ AD\ =\ \frac{1}{2}\ BC, then\ \ \angle BAC\ is$$

a. 90

b. 45

c. 60

d. 75

Ans. 90

Explanation: As per the question-

AD= BD = DC; => Angle BAD = Angle ABD; Angle CAD = Angle ACD;

A median also bisects the Angle BAC;

Angle BAD = Angle CAD;

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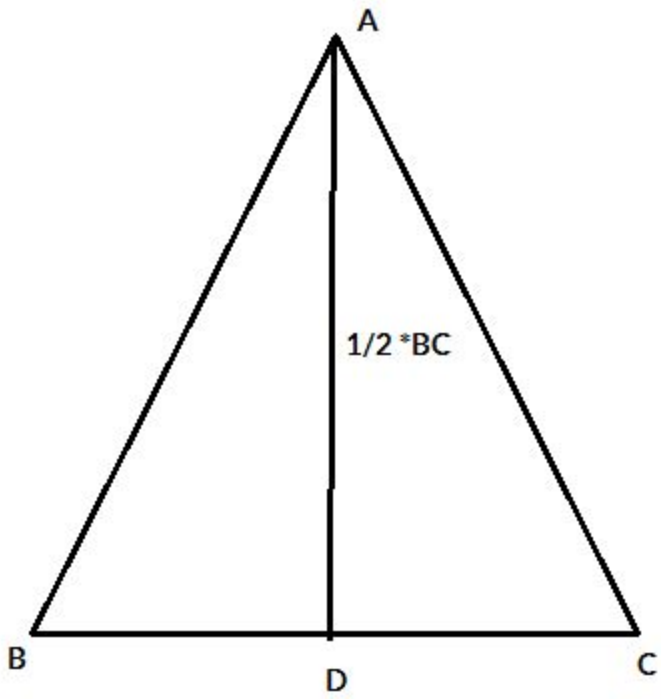
In triangle ABD from the above inferences; Angle BAD= 45=Angle CAD;

Hence; Angle BAC= 90;



Finally, the triangle will look like this-

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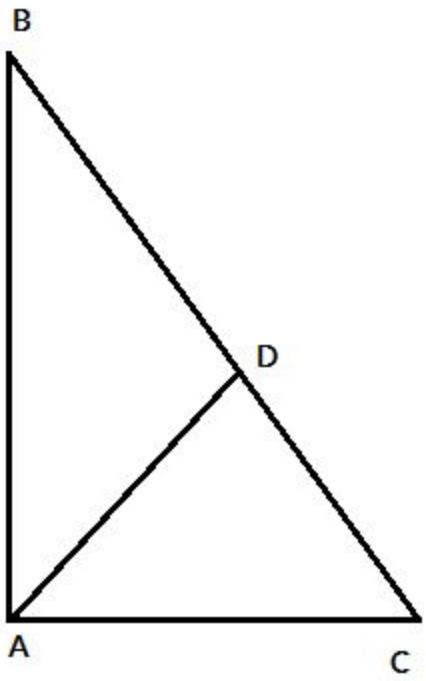

Question 19.

If $\frac{sin\theta+cos\theta}{sin\theta-cos\theta}$ = 3 then the value of $\sin^4\theta - \cos^4\theta$ is

a. 4/3

b. 3/4

c. 5/3

d. 3/5

Ans. 3/5

Explanation: sinθ+cosθ = 3*(sinθ – cosθ);

sinθ + cosθ= 3sinθ – 3 sosθ;

2sinθ = 4 cosθ; => tanθ= 2;

sinθ = 2/√5 ; cosθ =1/√5;

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Plug these values in the given problem-

$\sin^4\theta - \cos^4\theta = (2/\sqrt{5})^4 - (1/\sqrt{5})^4 = (16-1)/25 = 15/25 = 3/5;$

Question 20.A sphere has the same curved surface area as a cone of vertical height 40 cm and radius 30 cm. The radius of the sphere is

a. $5\sqrt{5}$ cm

b. $5\sqrt{3}$ cm

c. $5\sqrt{15}$ cm

d. $5\sqrt{10}$ cm

Ans. $5\sqrt{15}$ cm

Explanation: Let the sphere's radius = r;

The slant height of the cone= $\sqrt{40^2+30^2} = 50$

$4*pi*r^2 = pi*(30)*50;$

After solving,

$4* r^2 = 1500;$

$r^2 = 1500/4;$ => $r=5\sqrt{15}$ cm;

Question 21.The angle of elevation of the top of a tower from a point A on the ground is 30˚. On moving a distance of 20 metres towards the foot of the tower to a point B, the angle of elevation increases to 60˚. The height of the tower in meters is-

a. $\sqrt{3}$

b. $5\sqrt{3}$

c. $10\sqrt{3}$

d. $20\sqrt{3}$

Ans. $10\sqrt{3}$

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Explanation: In Triangle ABC,

tan60= h/x; => h = √3 x;

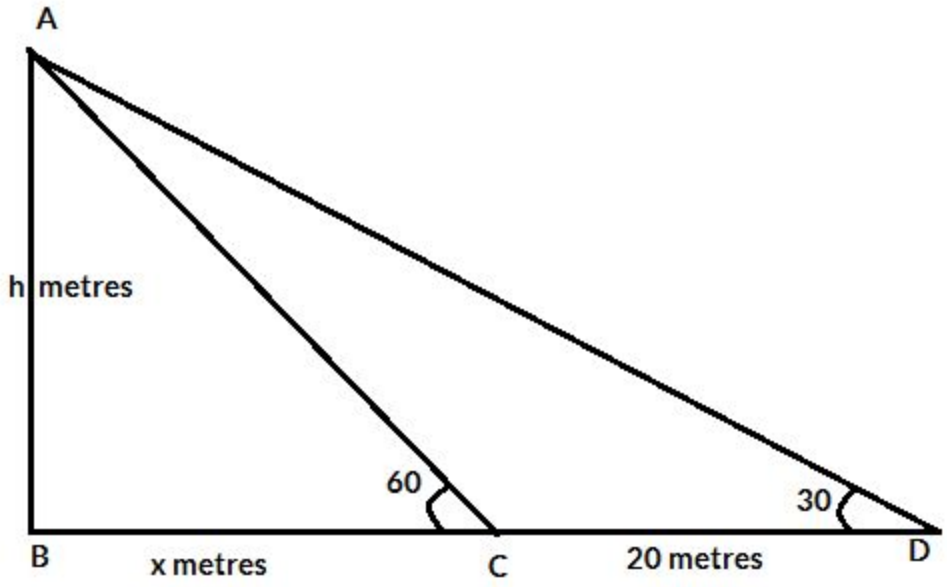
In Triangle ABD,

tan30= h/(x+20); => √3h= x + 20;

Put the value of h in the above equation-

3x = x + 20; => x =10 metres;

Hence, the height of tower = 10√3 metres;



Question 22.Given here is a pie chart of the cost of gold in 2010, 2011, 2012 and 2013. Study the chart and answer the following questions If the price of gold in 2013 is Rs. 31,500 per 10 gram, then the price of gold in 2011 per 10 gram is

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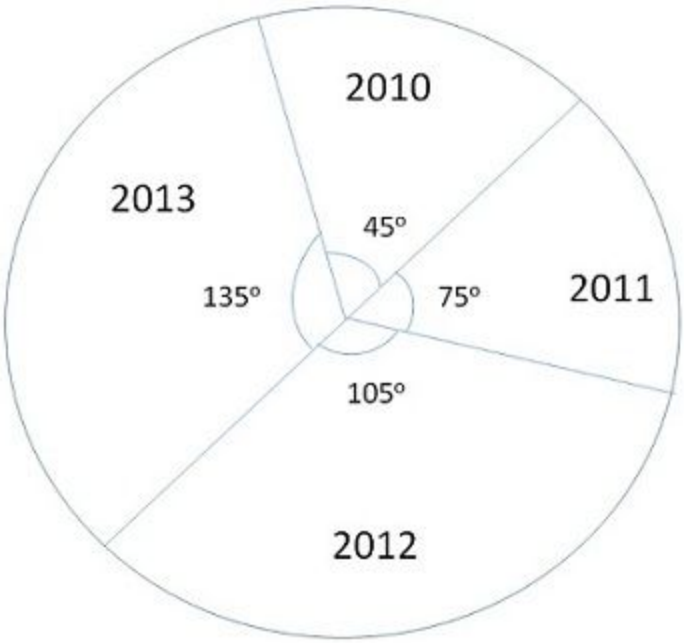

a. Rs.17000

b. Rs.17500

c. Rs.18000

d. Rs.18500

Ans. Rs.17500

Explanation: The required price of gold in 2011 per 10 gram = (75/135) * 31500 = Rs. 17500.

Question 23.Given here is a pie chart of the cost of gold in 2010, 2011, 2012 and 2013. Study the chart and answer the following questions

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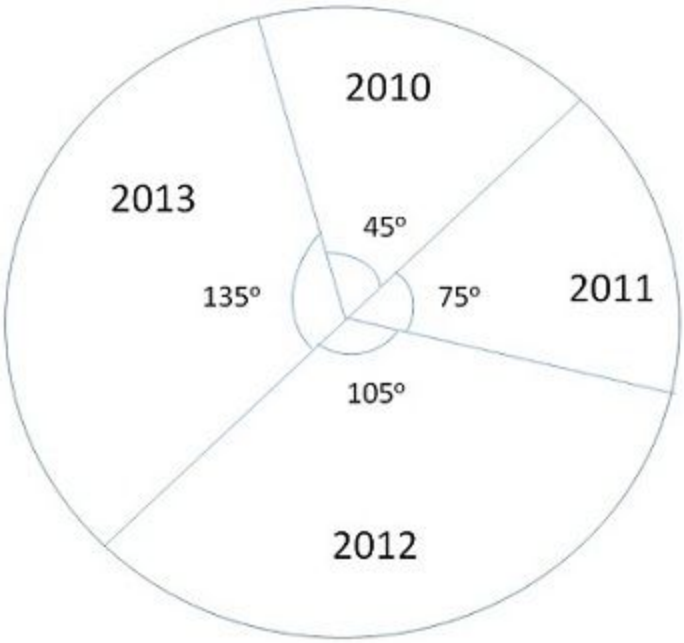

The ratio of the price of gold in the two years 2010 and 2013 is

a. 1:2

b. 1:3

c. 1:4

d. 1:5

Ans. 1:3

Explanation: the required ratio in 2010 and 2013= 45/135 => 1:3;

Question 24.Given here is a pie chart of the cost of gold in 2010, 2011, 2012 and 2013. Study the chart and answer the following questions

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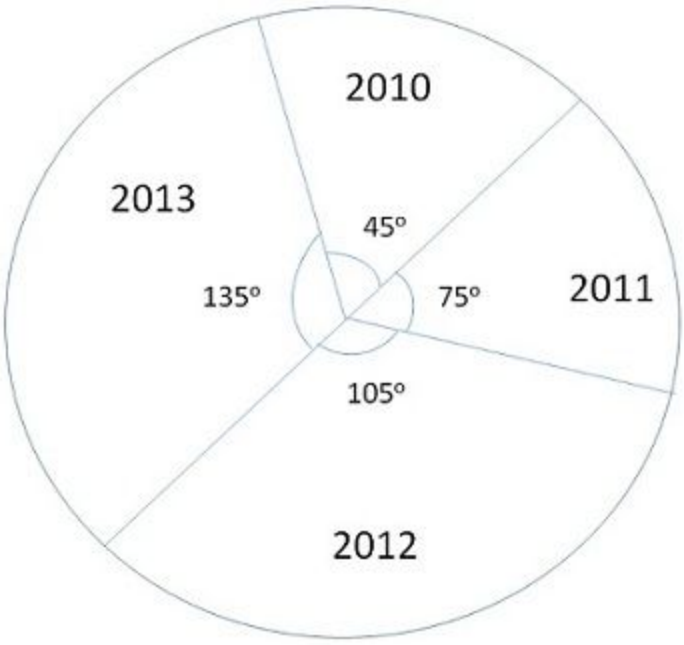

The percentage of increase in the price of gold from the year 2011 to 2013 is

a. 50%

b. 60%

c. 70%

d. 80%

Ans. 80%

Explanation: % increase in the price from year 2011 to 2013 = (135-75)*100/75 = 80%;

Question 25.Given here is a pie chart of the cost of gold in 2010, 2011, 2012 and 2013. Study the chart and answer the following questions

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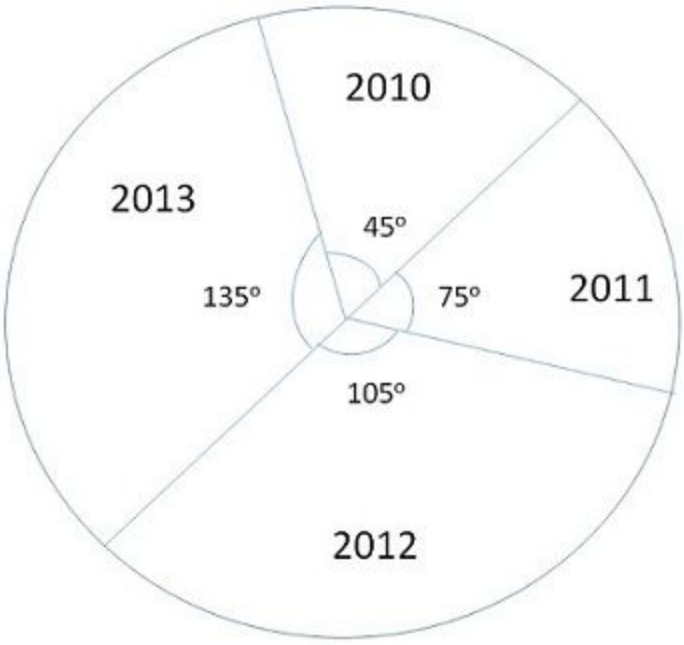

The ratio of percentage of increase in price of gold from 2011 to 2012 and 2012 to 2013 is

a. 6:5

b. 7:5

c. 8:5

d. 9:5

Ans. 7:5

Explanation: % increase from 2011 to 2012 = (105 – 75)*100/75 = 40%;

% increase from 2012 to 2013 = (135 – 105)*100/105 = (3000/105)%;

Hence, the required the ratio = 40/(3000/105) = 40*105/3000 = 4200/3000 => 7: 5;