1. 1990/II/9

If $a : b = 3 : 4$ and $b : c = 2 : 5$, then $a^2 : c^2 =$

A. 3 : 10 B. 9 : 25 C. 9 : 100 D. 36 : 25 E. 36 : 100

2. 1990/II/10

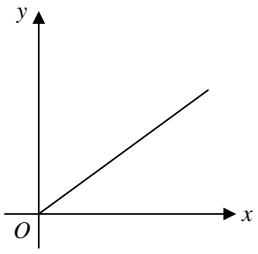
If 1 U.S. dollar is equivalent to 7.8 H.K. dollars and 1 000 Japanese yen are equivalent to 53.3 H.K. dollars, how many Japanese yen are equivalent to 50 U.S. dollars?

A. 1 463 B. 3 417 C. 7 317 D. 8 315 E. 20 787

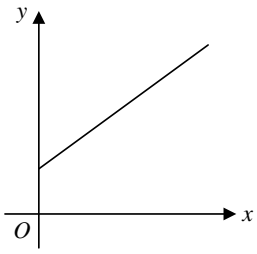
3. 1990/II/43

Which of the following graphs shows that y is partly constant and partly varies inversely as x?

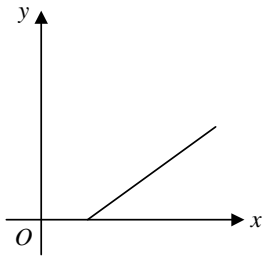
A.



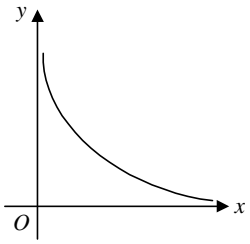
B.



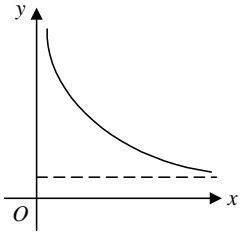
C.



D.



E.



4. 1991/II/9

Let y vary partly as $\frac{1}{x}$ and partly as x. When $x = 1$, $y = 5$ and when $x = 4$, $y = \frac{25}{2}$. Find y when $x = 2$.

A. $\frac{5}{2}$ B. 4 C. $\frac{25}{4}$ D. 7 E. $\frac{17}{2}$

5. 1991/II/10

If $\frac{1}{a} : \frac{1}{b} = 2 : 3$ and $a : c = 4 : 1$, then $a : b : c =$

A. 12 : 8 : 3 B. 8 : 3 : 2 . C. 4 : 6 : 1 D. 2 : 3 : 8 E. 2 : 3 : 4

6. 1991/II/42

3 kg of a solution contains 40% of alcohol by weight. How much alcohol should be added to obtain a solution containing 50% of alcohol by weight?

A. 0.3 kg B. 0.6 kg C. 0.75 kg D. 1.5 kg E. 3.75 kg

7. 1992/II/10

If $a : b = 2 : 3$, $a : c = 3 : 4$ and $b : d = 5 : 2$, find $c : d$.

A. 1 : 5 B. 16 : 45 C. 10 : 3 D. 20 : 9 E. 5 : 1

8. 1992/II/11

Suppose x varies directly as y^2 and inversely as z. Find the percentage increase of x when y is increased by 20% and z is decreased by 20%.

A. 15.2% B. 20% C. 50% D. 72.8% E. 80%

9. 1992/II/45

Coffee A and coffee B are mixed in the ratio $x : y$ by weight. A costs \$50/kg and B costs \$40/kg. If the cost of A is increased by 10% while that of B is decreased by 15%, the cost of the mixture per kg remains unchanged. Find $x : y$.

A. 2 : 3 B. 5 : 6 C. 6 : 5 D. 3 : 2 E. 55 : 34

10. 1993/II/35

If $a : b = 2 : 3$ and $b : c = 5 : 3$, then $\dfrac{a+b+c}{a-b+c} =$

A. –2 B. $\dfrac{5}{2}$ C. 4 D. $\dfrac{17}{2}$ E. 31

11. 1994/II/42

If $a : b = 2 : 3$, $a : c = 3 : 4$ and $a : d = 4 : 5$, then $b : c : d =$

A. 2 : 3 : 4 B. 3 : 4 : 5 C. 3 : 6 : 10 D. 18 : 16 : 15 E. 40 : 45 : 48

12. 1994/II/43

Let x vary inversely as $\sqrt{y}$. If y is increased by 69%, then x will be

A. increased by 23.1%(3 sig. fig.) B. increased by 30% C. decreased by 23.1%(3 sig. fig.)

D. decreased by 30% E. decreased by 76.9%(3 sig. Fig)

13. 1995/II/11

x and y are two variables. The table below shows some values of x and their corresponding values of y.

X	2	3	6	12
Y	36	16	4	1

Which of the following may be a relation between x and y?

A. $x \propto \sqrt{y}$ B. $x \propto y$ C. $x \propto \dfrac{1}{\sqrt{y}}$ D. $x \propto \dfrac{1}{y}$ E. $x \propto \dfrac{1}{y^2}$

14. 1995/II/12

If $125^x = 25^y$ and x, y are non-zero, find $x : y$.

A. 1 : 25 B. 1 : 5 C. 2 : 3 D. 3 : 2 E. 5 : 1

15. 1996/II/44

The following table shows the compositions of Tea A and Tea B which are mixtures of Chinese tea and Indian tea:

	Ratio of Chinese tea and Indian tea by weight
Tea A	3 : 1
Tea B	2 : 3

If 4 kg of tea A and 10 kg of tea B are mixed, find the ratio of Chinese tea and Indian tea in the mixture.

A. 2 : 5 B. 16 : 17 C. 1 : 1 D. 5 : 4 E. 23 : 17

16. 1997/II/11

In a map of scale 1 : 500 , the length and breath of a rectangular field are 2 cm and 3 cm respectively. Find the actual area of this field.

A. 30 m^2 B. 150 m^2 C. 1 500 m^2 D. 3 000 m^2 E. 15 000 m^2

17. 1997/II/39

Suppose x varies directly as y and inversely as z . When $y = 2$ and $z = 3$, $x = 7$. When $y = 6$ and $z = 7$, $x =$

A. 1 B. $\frac{49}{9}$ C. 9 D. $\frac{49}{4}$ E. 49

18. 1998/II/15

If $\frac{x+2y}{3x-4y}=5$, then $x : y =$

A. 3 : 7 B. 7 : 3 C. 7 : 11 D. 9 : 7 E. 11 : 7

19. 1998/II/17

If x varies inversely as y and directly as z^2 , then

A. $\frac{x}{yz^2}$ is a constant B. $\frac{xy}{z^2}$ is a constant C. $\frac{xz^2}{y}$ is a constant

D. $\frac{z^2}{y}$ is a constant E. $\frac{1}{y}+z^2$ is a constant

20. 1999/II/12

If $x : y = 3 : 4$ and $2x + 5y = 598$, find x.

A. 23 B. 26 C. 69 D. 78 E. 104

21. 1999/II/13

If 1 Australian dollar is equivalent to 4.69 H.K. dollars and 100 Japanese yen equivalent to 5.35 H.K. dollars, how many Japanese yen are equivalent to 1 Australian dollar? Give your answer correct to the nearest Japanese yen.

A. 4 B. 25 C. 88 D. 114 E. 2509

22. 1999/II/45

It is given that y varies inversely as x^3. If x is increased by 100%, then y is

A. increased by 800% B. increased by 700% C. decreased by 300%

D. decreased by 87.5% E. decreased by 12.5%

23. 2000/II/35

y varies directly as x^2 and inversely as $\sqrt{z}$. If $y = 1$ when $x = 2$ and $z = 9$, find y when $x = 1$ and $z = 4$.

A. $\frac{2}{3}$ B. $\frac{8}{3}$ C. $\frac{1}{6}$ D. $\frac{3}{8}$ E. $\frac{9}{26}$

24. 2000/II/36

Tea A and tea B are mixed in the ratio $x : y$ by weight. A costs \$80/kg and B costs \$100/kg. If the cost of A is increased by 10% and that of B is decreased by 12%, the cost of the mixture per kg remains unchanged. Find $x : y$.

A. 1 : 1 B. 2 : 3 C. 3 : 2 D. 5 : 6 E. 6 : 5

25. 2001/II/29

Suppose y is partly constant and partly varies inversely as x. When $x = 1$, $y = 7$ and when $x = 3$, $y = 3$. Find y when $x = 2$.

A. 2.5 B. 3.5 C. 4 D. 5 E. 6.5

26. 2002/II/10

If 1 Euro is equivalent to 6.94 H.K. dollars and 1 U.S. dollar is equivalent to 7.78 H.K. dollars, how many Euros are equivalent to 100 U.S. dollars? Give your answer correct to the nearest Euro.

A. 89 B. 112 C. 129 D. 144

27. 2002/II/13

If $2x = 3y = 4z$, then $\frac{x + y - z}{x - y + z} =$

A. $\frac{1}{5}$ B. $\frac{1}{3}$ C. $\frac{5}{3}$ D. $\frac{7}{5}$

28. 2002/II/15

It is given that y varies inversely as x. If x is increased by 50%, then y is decreased by

A. $33\frac{1}{3}\%$ B. 50% C. $66\frac{2}{3}\%$ D. 100%

29. 2003/II/13

If $81^x = 27^{2y}$ and x, y are non-zero integers, then $x : y =$

A. 2 : 3 B. 3 : 4 C. 4 : 3 D. 3 : 2

30. 2003/II/14

Suppose z varies directly as x^2 and inversely y. When $x = 4$ and $y = 3$, $z = 2$. When $x = 2$ and $z = 3$, $y =$

A. $\frac{1}{2}$ B. 1 C. 2 D. 18

31. 2003/II/15

The scale of a map is 1 : 4 000. If the actual area of a sports field is 8 000 m^2, find its area on the map.

A. 0.02 cm^2 B. 0.05 cm^2 C. 2 cm^2 D. 5 cm^2

32. 2004/II/13

If $(a - b) : (b - 2a) = 2 : 3$, then $a : b =$

A. 3 : 5 B. 5 : 3 C. 5 : 7 D. 7 : 5

33. 2004/II/14

A box contains two kinds of coins: $ 5 and $ 2. The ratio of the number of $ 5 coins to the number of $ 2 coins is 4 : 5. If the total value of the coins is $ 90, then the total number of coins in the box is

A. 9 B. 18 C. 27 D. 36

34. 2004/II/15

The scale of a map is 1 : 20 000. If two buildings are 3.8 cm apart on the map, then the actual distance between the two buildings is

A. 0.076 km B. 0.76 km C. 7.6 km D. 76 km

35. 2004/II/16

It is known that y varies partly as x and partly as $\sqrt{x}$. When $x = 1$, $y = 4$ and when $x = 4$, $y = 10$. Find y when $x = 16$.

A. 28 B. 52 C. 80 D. 256

36. 2005/II/13

Let x and y be non-zero numbers. If $2x - 3y = 0$, then $(x + 3y) : (x + 2y) =$

A. 3 : 2 B. 4 : 3 C. 9 : 7 D. 11 : 8

37. 2005/II/14

If z varies directly as y^2 and inversely as x, which of the following must be constant?

A. xy^2z B. $\frac{y^2z}{x}$ C. $\frac{xz}{y^2}$ D. $\frac{z}{xy^2}$

38. 2006/II/13

Let x , y and z be non-zero numbers. If $x : y = 1 : 2$ and $y : z = 3 : 1$, then $(x + y) : (y + z) =$

A. 3 : 4 B. 4 : 3 C. 8 : 9 D. 9 : 8

39. 2006/II/14

It is given that x varies directly as y and inversely as z^2 . If y is decreased by 10% and z is increased by 20%, then x is decreased by

A. 10% B. 23.6% C. 25% D. 37.5%

40. 2006/II/15

The scale of a map is 1 : 8 000 . If the area of a park on the map is 2 cm^2 , then the actual area of the park is

A. 4 000 m^2 B. 6 400 m^2 C. 12 800 m^2 D. 16 000 m^2

41. 2007/II/13

Let a and b be non-zero numbers. If $7a + 5b = 3a + 8b$, then $a : b =$

A. 3 : 4 B. 4 : 3 C. 10 : 13 D. 13 : 10

42. 2007/II/14

It is given that y is partly constant and partly varies directly as x . When $x = 2$, $y = 17$ and when $x = 4$, $y = 11$. Find the value of x when $y = 5$.

A. –3 B. 6 C. 8 D. 112

43. 2008/II/13

The costs of rice of brand A and rice of brand B are \$8 / kg and \$4 / kg respectively. If x kg of rice of brand A and y kg of rice of brand B are mixed so that the cost of the mixture is \$5 / kg , find $x : y$.

A. 1 : 2 B. 2 : 1 C. 1 : 3 D. 3 : 1

44. 2008/II/14

Suppose that y varies directly as x and inversely as z^2 . If x and z are both decreased by 20% , then y

A. is decreased by 17% B. is decreased by 20%

C. is increased by 20% D. is increased by 25%

45. 2008/II/15

It is known that f(x) varies partly as x and partly as x^2 . If f(1) = 5 and f(2) = 16 , then f(3) =

A. 21 B. 27 C. 33 D. 57