

INDIVIDUAL TEST

TEAM QUESTIONS

1. A

16. C

1. $\frac{23}{90}$

2. B

17. C

2. 30

3. D

18. C

3. $\frac{25}{2}$

4. B

19. E (56)

4. $3\frac{1}{3}$ hrs

5. C

20. D

5. 49

6. A

21. C

6. 8

7. E (-2)

22. A

7. $2\frac{2}{3}$ hrs

8. C

23. C

8. $\frac{13}{16}$

9. E $(15 + 5\sqrt{5})$

24. C

9. 18

10. D

25. B

10. $\frac{-2x + 4}{3x^2 + 2x}$

11. C

26. A

11. 2.6

12. A

27. D

12. -21.5

13. D

28. B

13. $k = 15$

14. D

29. D

14. $r = \frac{ax}{a-8}$

15. B

30. D

15. 1260

Algebra

1.) Rational numbers are a subset of the Reals, not the other way around. (A)

2.) $4 + 2^2 \cdot 2 + 7 \div 14 + 1 \div 2 \cdot 9$
 $4 + (2^2)(2) + (\frac{7}{14}) + (\frac{1}{2})9$
 $4 + 8 + \frac{1}{2} + \frac{9}{2}$
 $12 + 5$
 17 (B)

3.) $2^{100} \cdot 4^{76} = 2^{100} \cdot (2^2)^{76}$
 $= 2^{100} \cdot 2^{152}$
 $= 2^{252}$ (D)

4.) $5 - (x^2 + x - 6) = 9 - x^2$
 $5 - x^2 - x + 6 = 9 - x^2$
 $11 - x = 9$
 $2 = x$ (B)

5.) $3x - 7 \geq 2$ AND $3x - 7 < 14$
 $3x \geq 9$ $3x < 21$
 $x \geq 3$ AND $x < 7$

AND $5x + 6 > -4$ AND $5x + 6 \leq 21$
 $5x > -10$ $5x \leq 15$
 $x > -2$ $x \leq 3$

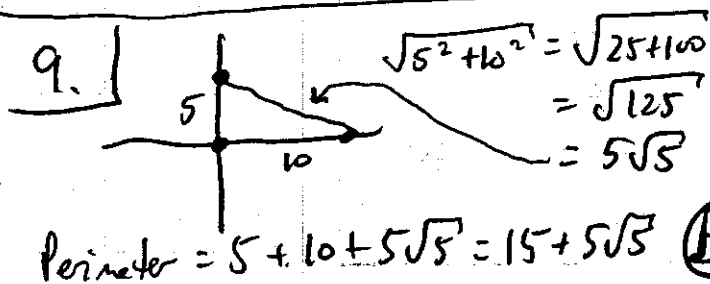
only 3 is included in intersection of sets.

(C)

6.) $kx - 2ky + mx - 2my$
 $= k(x - 2y) + m(x - 2y)$
 $= (k + m)(x - 2y)$ (A)

7.) $5 = 1 - 2x$
 $4 = -2x$
 $-2 = x$ (E)

8.) $\left(\frac{b^n c^{2n-1}}{b^{n+1} c^{2n}}\right)^{-2} = \left(\frac{1}{bc}\right)^{-2}$
 $= (bc)^2 = b^2 c^2$ (C)



10. $4x\left(x + \frac{1}{x} = \frac{17}{4}\right), 2x = ?$

$4x^2 + 4 = 17x$
 $4x^2 - 17x + 4 = 0$
 $(4x - 1)(x - 4) = 0$
 $x = 4$ or $\frac{1}{4}$, but since x is larger than $\frac{1}{4}$

$\rightarrow x = 4 \Rightarrow 2x = 8$ (D)

11.) $2ax - 4ay + bx - 2by$
 $= 2a(x - 2y) + b(x - 2y)$
 $= (2a + b)(x - 2y)$ (C)

2.) $\sqrt{x^4} = x^2$
 POLYNOMIAL (A)

13.) If $F=C$, then
 $C = \frac{9}{5}C + 32$
 $-\frac{4}{5}C = 32$
 $C = 32(-\frac{5}{4})$
 $C = -40$ (D)

- 14.)
 I. No $(-2) + (-2) = -4$
 II. No $(-2)(-2) = 4$
 III. No -2 's reciprocal is $-\frac{1}{2}$
 IV. Yes Always True
 V. Yes 0
 VI. Yes Always True
 VII. Yes Always True
 VIII. Yes Always True 5 (D)

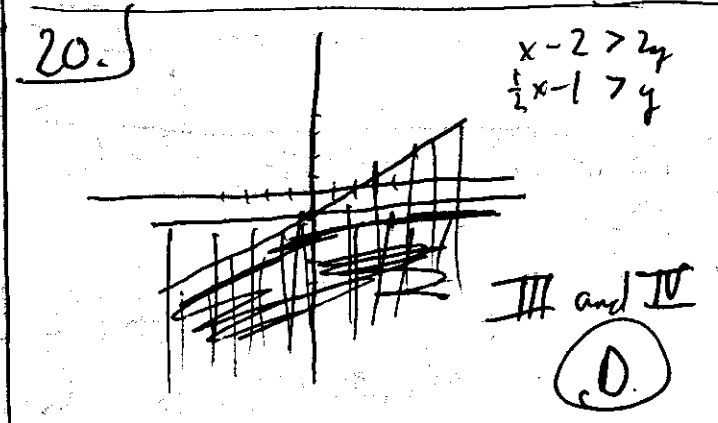
15.) $(2^2)^{300} + (2^3)^{200} + (2^4)^{150} + 2^{600}$
 $2^{600} + 2^{600} + 2^{600} + 2^{600}$
 $4(2^{600})$
 $2^2(2^{600})$
 2^{602} (B)

16.)
 $2^{11} - 2^9 - 2^8 - 2^7 - 2^6 - 2^5 - 2^4 - 2^3 - 2^2 - 2 - 1$
 $2048 - 512 - 256 - 128 - 64 - 32 - 16 - 8 - 4 - 2 - 1$
 $2048 - (1023)$
 1025 (C)

17.) 485100
 $(2^2) 3^3 \cdot 5^2 \cdot 7^2$ (11)
 664048
 $(2^4) \cdot 7^3 \cdot 11^2$ $2^2 \cdot 11$
 44 (C)
 $(2^3) 3^3 5^3 \cdot 11$

18.) $(\sqrt{6} - 3) \left(\frac{1}{2 - \sqrt{6}} \right)$
 $= \frac{\sqrt{6} - 3}{2 - \sqrt{6}} \cdot \frac{(2 + \sqrt{6})}{(2 + \sqrt{6})}$
 $= \frac{2\sqrt{6} + 6 - 6 - 3\sqrt{6}}{4 + 2\sqrt{6} - 2\sqrt{6} - 6}$
 $= \frac{-\sqrt{6}}{-2}$
 $= \frac{\sqrt{6}}{2}$ (C)

19.) $(x-r_1)(x-r_2) = x^2 - (r_1+r_2)x + r_1r_2$
 $A = -7$
 $B = -8$
 $A \cdot B = 56$ (E)
 $x^2 + 7x + 10$
 $7 = -(r_1+r_2)$
 $-7 = r_1+r_2$
 $x^2 - 2x - 8$
 $r_1, r_2 = -8$



$$\frac{6x^2 + 31x + 35}{6x^2 + 39x + 63} = \frac{(2x+7)(3x+5)}{(6x+21)(x+3)}$$

$$= \frac{3(x+3)(x+1)}{(2x+7)(3x+5)} \left(\frac{3(2x+7)(3x+5)}{3(2x+7)(x+3)} \right)$$

$$= x+1 \quad \text{at } x=11$$

12 (C)

$$\frac{100 \cdot 50.4}{112} = n \Rightarrow \frac{5040}{112} = n$$

$$n = 45$$

45% (C)

$$25. \quad \frac{2}{x} + \frac{5}{y} = 2$$

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

$$0 + \frac{11}{y} = \frac{1}{2}$$

$$\frac{4}{11} = 2$$

$$y = 22$$

$$\frac{1}{x} - \frac{3}{22} = \frac{3}{4}$$

$$\frac{1}{x} = \frac{3}{22} + \frac{3}{4}$$

$$\frac{1}{x} = \frac{6+33}{44}$$

$$\frac{1}{x} = \frac{39}{44}$$

$$x = \frac{44}{39}$$

$$78x - 2y$$

$$78 \left(\frac{44}{39} \right) - 2(22)$$

$$88 - 44$$

$$44$$

(B)

$$22. \quad n=q \quad d=p+5$$

$$p+n+d+q = 29$$

$$p+n+(p+5)+n = 29$$

$$2p+2n = 24$$

$$p+n = 12$$

$$.01p + .05n + .10d + .25q = 3.15$$

$$.01p + .05n + .10(p+5) + .25(n) = 3.15$$

$$.01p + .05n + .10p + .50 + .25n = 3.15$$

$$(.11p + .30n = 2.65) \cdot 100$$

$$11p + 30n = 265$$

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$$(p+n = 12) \cdot 11$$

$$0 + 19n = 265 - 12 \cdot 11$$

$$19n = 133$$

$$n = 7 \times .05 = .35$$

$$q = 7 \times .25 = 1.75$$

\$2.10 (A)

$$23. \quad i^1 = i \quad i^2 = -1 \quad i^3 = -i \quad i^4 = 1$$

$$i^5 = i \dots$$

$$i^1 + i^2 + i^3 + i^4 = 0$$

$$i^5 + i^6 + i^7 + i^8 = 0 \quad + i^0 = 1$$

$$i^{97} + i^{98} + i^{99} + i^{100} = 0$$

(C)

$$26. \quad x - m \quad 4\%$$

$$1200 - x - m \quad 6\%$$

$$.04x = (1200 - x) \cdot .06 + 3$$

$$.04x = 72 - .06x + 3$$

$$.10x = 75$$

$$x = 750$$

$$1200 - x = 1200 - 750 = 450$$

(A)

1.) $(2, \frac{1}{2})$ slope = $\frac{1}{7-1} = \frac{1}{6}$
 $(4, \frac{7}{2})$ \perp slope = -6

$$y = -6x + b$$

$$y = -6(4) + b$$

$$\frac{7}{2} = -24 + b$$

$$(\frac{7}{2} + \frac{48}{2}) \rightarrow \frac{55}{2} = b$$

$$y = -6x + \frac{55}{2}$$

$$6x + y = \frac{55}{2}$$

$$12x + 2y = 55$$

(D)

28.) $0!, 1!, 2!, 3!, 4!, 5!, 6!, 7!, \underline{8!}$ or 40320 (B)

29.) $.147 = \infty$

$$\begin{array}{r} 100x = 1.4747 \\ -x = -.147 \\ \hline 99x = 14.6 \end{array}$$

$$99x = 14.6$$

$$x = \frac{146}{990} = \frac{73}{495}$$

(D)

30.) $10^{3.528} \approx (10^{1.176})^3 \approx 15^3 \approx 3375$ (D)