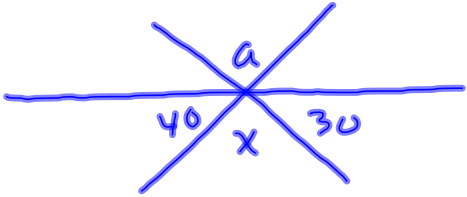1) $7x - 21 = 3x + 9$

$4x = 30$

$x = 7.5$

(D)

2) $a = b^2$    $b = c\sqrt{2}$    $a = 18$

$18 = b^2$    $3\sqrt{2} = c\sqrt{2}$

$\sqrt{18} = b$

$\sqrt{2}\sqrt{9} = b$    (A)

$3\sqrt{2} = b$

$\sqrt{ab} = \sqrt{a}\sqrt{b}$

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3) $|5 - 7| = 2$    (C)

4)



$30 + 40 + x = 180$

$x = 110$    $x = a$    (C)

5) side $CD = 7$

so $x$ for $A, B$ must be $-4, 10$

(C)

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6) $\dfrac{(\cancel{x-3})(x+2)}{\cancel{x+5}} \cdot \dfrac{(\cancel{x+5})(x-2)}{2(\cancel{x-3})}$

$\dfrac{(x+2)(x-2)}{2} = \dfrac{x^2-4}{2}$  $\boxed{C}$

7) $1000 = 475 + .07x$

$\dfrac{525}{.07} = \dfrac{.07x}{.07}$  $\boxed{E}$

$7500 = x$

---

side
bar

$x^2-x-6$  $x^2+3x-10$
$(x+2)(x-3)$  $(x-2)(x+5)$

8) 
$$x - y = 5$$
$$\underline{x + y = 5}$$
$$2x = 10$$
$$x = 5$$
$$y = 0$$

(A)

0

9) 
$$f(x) = -2x^2 - 3x$$
$$f(-5) = -2(25) - 3(-5)$$
$$= -50 + 15$$
$$= -35$$

(B)

10) 
$$2\pi r = a$$
$$\pi r^2 = b$$

(B)

$$2\cancel{\pi} r = \cancel{\pi} r^2$$
$$2r = r^2$$
$$2 = r$$

11) 
$$\sqrt{n+2} = \frac{2}{3}$$
$$n + 2 = \frac{4}{9}$$
$$9n + 18 = 4$$
$$9n = -14$$
$$n = -\frac{14}{9}$$

(A)

12)   6, 8, X

$a+b > c$      $X < 14$

$8 + X > 6$

$6 + X > 8$     $\underline{X > 2}$

           3, 4, ... , 13

                        Ⓟ

    a     b

    c    $a + b > c$

13)   $a = 1$     (2 is prime)

     $b = 1$     (7, duh!)

     $c = 0$     (9 isn't prime!)

     $\underline{d = 2}$     (23, 29)

       4                  Ⓒ

14)   $f(x) = x^2 - 11$

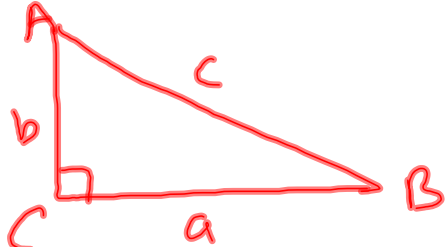    $x^2 - 11 < 25$

      $x^2 < 36$

      $x < 6$     Ⓔ

      $x > -6$

## 15)



$$\sin A = \frac{a}{c}$$
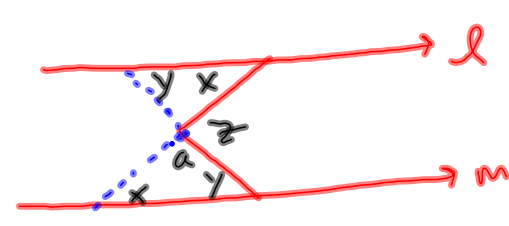$$\tan A = \frac{a}{b}$$

I $\sqrt{c^2 - b^2}$ ✓

II $c \sin A$ ✓

III $b \tan A$ ✓

$$c^2 = a^2 + b^2$$
$$c^2 - b^2 = a^2$$

(E)

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## 16)



$a = 180 - (x + y)$

$a = 180 - z$

$180 - z = 180 - x - y$

$z = x + y$

$x = z - y$

(C)

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17) $\dfrac{ab}{6}$ = integer

I - a=1 b=6 ✗

II - a=2 b=3 ✗

III - ab= 6x ✓

D

18) $M_{AB} = \dfrac{-3-0}{0-4} = \dfrac{3}{4}$

$M_{\perp} = -\dfrac{4}{3}$

A

19) $2^{3x-1} = 16$

$2^{3x-1} = 2^4$

$3x-1 = 4$
$3x = 5$
$x = \dfrac{5}{3}$

E

20) $V_0 = l \cdot w \cdot h$

$V_1 = (1.2l)(1.2w)(1.25h)$

$V_1 = 1.8\,lwh$      80% inc

D

**21)**
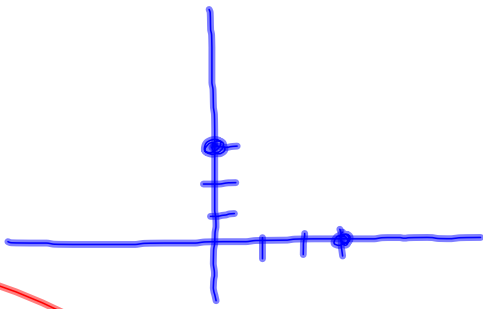
$$(0,3) = (X, Y)$$
$$Y = ax^2 + bx + c$$
$$3 = C$$
$$(3, 0) = (X, Y)$$
$$0 = 9a + 3b + 3$$
$$0 = 3a + b + 1$$
$$b = -3a - 1$$

$\textcircled{D}$

only

C, D are parabolas

(3,0) is not on C

so

---

**22)**

$$\left.\begin{matrix} 100 \\ \downarrow \\ 499 \end{matrix}\right\} 900$$
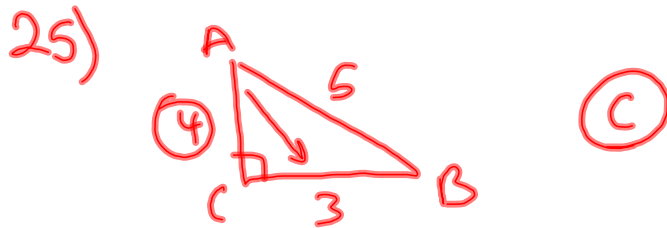
2
3
4 ×
5
6 ×
7
8 ×
9 ×

$$\frac{4}{9} \times \frac{4}{10} \times \frac{4}{10} = \frac{64}{900}$$

$\textcircled{D}$

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**23)** $y = ax + b$  $m = a$

$x = cy + d$

$cy = x - d$

$y = \frac{1}{c}x - \frac{d}{c}$  $m = \frac{1}{c}$

Ⓑ

**24)** $\sqrt{x-1} = \sqrt{-5-1} = \sqrt{-6}$  Ⓑ

**25)**

④



Ⓒ

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**26)** $\frac{15}{25} = \frac{60}{100}$  60%  Ⓓ

**27)** $\left|\frac{2x}{3} - 4\right| < 5$

$\frac{2x}{3} - 4 < 5$     $-\left(\frac{2x}{3} - 4\right) < 5$

$\frac{2x}{3} < 9$          $\frac{2x}{3} - 4 > -5$

$2x < 27$          $\frac{2x}{3} > -1$

$x < 13.5$          $2x > -3$

$x > -\frac{3}{2}$

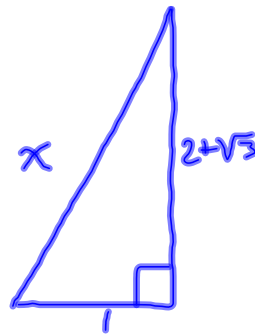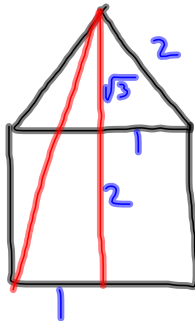$-1, 0, 1 \ldots 13$

Ⓓ

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**28)**

$$I_{04} = n * p$$

$$I_{05} = (1.2n) * (1.1\,p)$$

$$= 1.32\,np$$

(E)

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**29)**



$$x = \sqrt{1^2 + (2+\sqrt{3})^2}$$

$$(2+\sqrt{3})(2+\sqrt{3}) = 4 + 4\sqrt{3} + 3 = 7 + 4\sqrt{3}$$

$$x = \sqrt{8 + 4\sqrt{3}}$$

$$x = 3.86$$

(C)

30) $x^2 + 5x + k = 0$

$\overline{\sqrt{25 - 4(1)(k)}} \geqslant 0$

$\sqrt{25 - 4k} \geqslant 0$

$25 - 4k \geqslant 0$ (B)

$25 \geqslant 4k$

$6.25 \geqslant k$

31) $m_r = \dfrac{2-6}{0-3} = \dfrac{4}{3}$ $y - y_1 = m(x - x_1)$

$m_t = -\dfrac{3}{4}$

$y - 6 = -\dfrac{3}{4}(x - 3)$

$y = -\dfrac{3}{4}x + \dfrac{9}{4} + 6$ (E)

$y = -\dfrac{3}{4}x + \dfrac{33}{4}$

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32) Ed × Bob × x

$1 \cdot 3 \cdot 1 \cdot 2 \cdot 1 = 6 \times 2$ (B)

$= 12$

33) $r_1 + r_2 = -\dfrac{b}{a}$ $r_1 r_2 = \dfrac{c}{a}$

$-\dfrac{b}{a} = \dfrac{c}{a}$ (B)

$-b = c$

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34)   A   $\frac{1}{3}$ ) = 60 min       $\frac{1}{180}$ = 1 min

      M   $\frac{1}{5}$ ) = 60 min       $\frac{1}{300}$ = 1 min
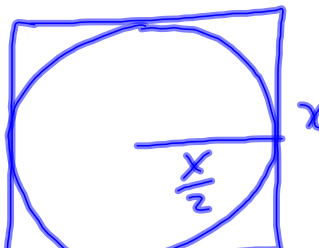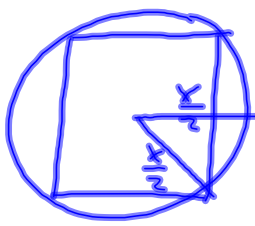
$\frac{1}{180} + \frac{1}{300}$

$\frac{5}{900} + \frac{3}{900} = \frac{8}{900}$ /min

$\frac{900}{8}$ min = $\boxed{B}$
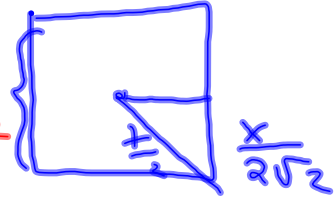
Jul 13-10:59 AM

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35)



P = 4X

$\dfrac{4X}{\frac{4X}{\sqrt{2}}} = \dfrac{4X\sqrt{2}}{4X}$

$\frac{1}{4}X$ , $\frac{X}{4\sqrt{2}}$ , $\frac{X}{2}$ , $\frac{X}{2\sqrt{2}}$

P = $\dfrac{4X}{\sqrt{2}}$

$\boxed{C}$

Jul 13-11:08 AM