

$$\textcircled{1} \quad 1.25 \times 0.01$$

$$0.0125 \times 2$$

$$0.025 \quad \textcircled{B}$$

$$\textcircled{2} \quad 3 \left( \frac{5}{12} + \frac{3}{8} \right)$$

$$3 \left( \frac{10}{24} + \frac{9}{24} \right)$$

~~$$3 \left( \frac{19}{24} \right)$$~~

$$\frac{57}{24} = \frac{19}{8} \quad \textcircled{D}$$

$$\textcircled{3} \quad \frac{1}{(\sqrt{2} + \sqrt{3})(\sqrt{2} - \sqrt{3})}$$

$$\frac{\sqrt{2} - \sqrt{3}}{2 - \cancel{\sqrt{6}} + \cancel{\sqrt{6}} - 3}$$

$$\frac{\sqrt{2} - \sqrt{3}}{-1}$$

$$-\sqrt{2} + \sqrt{3}$$

$$\sqrt{3} - \sqrt{2} \quad \textcircled{D}$$

$$\textcircled{4} \quad \frac{y \cdot \frac{x}{1} - \frac{1}{y} \cdot y}{\frac{x}{y} \cdot y}$$

$$\frac{xy - 1}{x} \quad \textcircled{E}$$

$$\textcircled{5} \quad \frac{1}{x-2} - \frac{1}{x+2}$$

$$\frac{1(x+2)}{(x-2)(x+2)} - \frac{1(x-2)}{(x-2)(x+2)}$$

$$\frac{x+2 - x+2}{(x-2)(x+2)}$$

$$\frac{4}{x^2 - 4} \quad \textcircled{D}$$

$$\textcircled{6} \quad \underline{2x^2} - 5x + \underline{3} \quad \begin{array}{l} -2x - 3 = 6 \\ -2 + 3 = -5 \end{array}$$

$$(2x^2 - 2x)(-3x + 3)$$

$$2x(x-1) - 3(x-1)$$

$$\underline{(x-1)(2x-3)}$$

$\textcircled{B}$

$$\frac{(x-2)(x-3)}{2}$$

$$(x-1)(2x-3)$$

$$\textcircled{1} \quad x^2 - x = 6$$
$$x^2 - x - 6 = 0$$

$$(x-3)(x+2) = 0$$

$$x-3=0 \quad | \quad x+2=0$$

$$x=3 \quad | \quad x=-2$$

$\textcircled{A}$

$$\textcircled{8} \quad x^2 + 6x + 7 = 0$$

$$a=1 \quad b=6 \quad c=7$$

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$X = \frac{-6 \pm \sqrt{36 - 28}}{2}$$

$$X = \frac{-6 \pm \sqrt{8}}{2}$$

$$X = \frac{-6 \pm 2\sqrt{2}}{2}$$

$$X = -3 \pm \sqrt{2}$$

$\textcircled{B}$

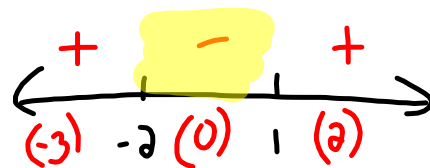
$$\textcircled{11} \quad (x-1)(x+2) < 0$$

*where is y negative*

$$y = (x-1)(x+2)$$

$$x\text{-int } (y=0)$$

$$x = 1, -2$$



$$-2 < x < 1$$

$$(-2, 1)$$

$$\textcircled{12} \quad |x-3| \leq 5$$

$$\textcircled{12} \quad \text{case 1: (+)}$$

$$+(x-3) \leq 5$$

$$x-3 \leq 5$$

$$x \leq 8$$

$$\text{case 2: (-)}$$

$$-(x-3) \leq 5$$

$$-x+3 \leq 5$$

$$-x \leq 2$$

$$x \geq -2$$

$$-2 \leq x \leq 8$$

$\textcircled{C}$

$$\textcircled{13} \quad 8^{-\frac{1}{3}} \times 3^0$$

$$\left(\frac{1}{8}\right)^{\frac{1}{3}} \times 1$$

$$\frac{\sqrt[3]{1}}{\sqrt[3]{8}} \times 1$$

$$\frac{1}{2} \times 1$$

$$\textcircled{\frac{1}{2}}$$

C

$$\textcircled{14} \quad 2^{-3} + 2^3$$

$$\left(\frac{1}{2}\right)^3 + 8$$

$$\frac{1}{8} + \frac{8}{1}$$

$$\frac{1}{8} + \frac{64}{8}$$

$$\textcircled{\frac{65}{8}}$$

D

$$\textcircled{16} \quad \frac{1}{(8x^3)^{1/3}} \cdot (4x^2)^{1/2}$$

$$\frac{\sqrt[3]{8x^3}}{2x}$$

$$\frac{1}{2x} \cdot 2x$$

$$1 \quad \textcircled{C}$$

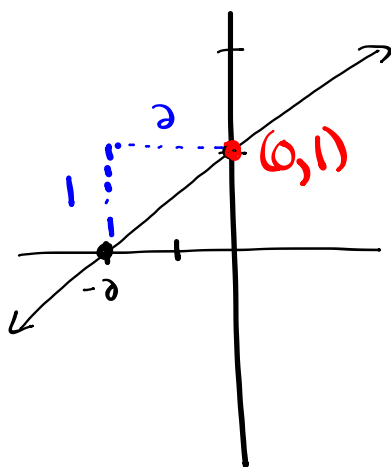


$$2^x = 20$$

$$\log_{\underset{B}{2}} \underset{A}{20} = \underset{E}{x} \quad \textcircled{E}$$

Logs are BAE  
 a s s x  
 e s s p  
 r e s t  
 t s e s t

③



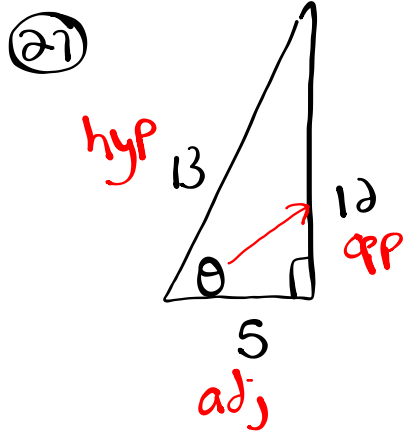
$$b = 1$$

$$m = \frac{1}{2}$$

$$y = mx + b$$

$$y = \frac{1}{2}x + 1$$

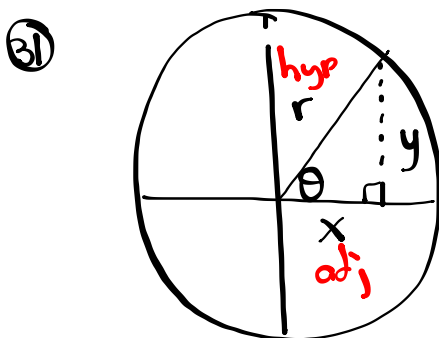
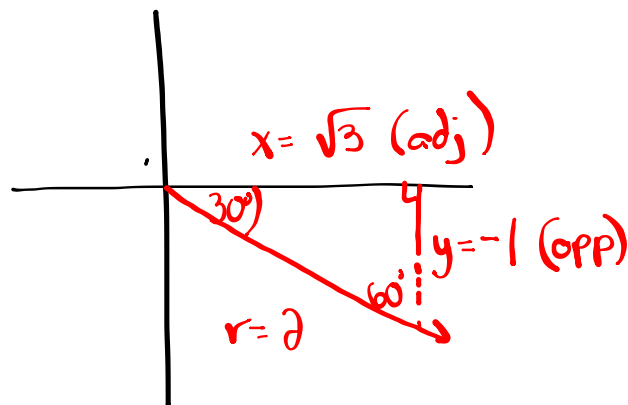
③



$$\sin \theta = \frac{\text{opp}}{\text{hyp}} = \frac{12}{13} \quad \text{C}$$

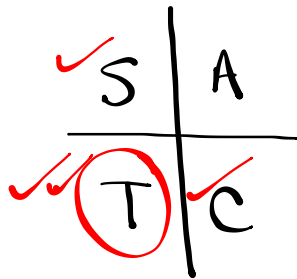
30

$$\tan(-30^\circ) \text{ or } \tan 330^\circ = \frac{-1}{\sqrt{3}} \quad \text{C}$$



$$\sec \theta = \frac{\text{hyp}}{\text{adj}} = \frac{r}{x} \quad \text{B}$$

③⑦  $\sin \theta = -\frac{1}{\sqrt{10}}$  <sup>opp</sup> and  $\cos \theta < 0$  ... find  $\tan \theta$

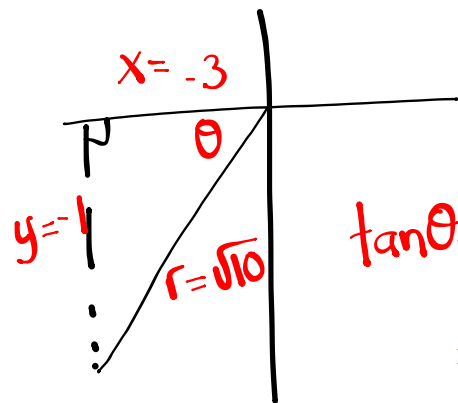


Given:

$$\text{opp} = y = -1$$

$$\text{hyp} = r = \sqrt{10}$$

$$\text{adj} = x = ?$$



$$\tan \theta = \frac{-1}{-3} = \frac{1}{3}$$

$$x^2 + y^2 = r^2$$

$$x^2 + 1 = 10$$

$$x^2 = 9$$

$$x = \pm 3$$

$$x = -3 \text{ (Q3)}$$

Ⓔ

$$\textcircled{1} \quad 1.25 \times 0.01 = 0.0125 \times 2 = 0.025 \quad \textcircled{B}$$

$$\textcircled{2} \quad 3\left(\frac{5}{12} + \frac{3}{8}\right)$$

$$3\left(\frac{10}{24} + \frac{9}{24}\right)$$

$$3\left(\frac{19}{24}\right)$$

$$\frac{57}{24}$$

$$\textcircled{\frac{19}{8}} \quad D$$

$$\textcircled{3} \quad \frac{1}{(\sqrt{2} + \sqrt{3})(\sqrt{2} - \sqrt{3})}$$

$$\frac{\sqrt{2} - \sqrt{3}}{2 - \cancel{\sqrt{6}} + \cancel{\sqrt{6}} - 3}$$

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$$\textcircled{4} y \cdot \frac{\frac{x}{1} - \frac{1}{y} \cdot y}{\frac{x}{y} \cdot y}$$

$$\frac{xy - 1}{x} \quad \textcircled{E}$$

$$\textcircled{5} \frac{1}{x-2} - \frac{1}{x+2}$$

$$\frac{1(x+2)}{(x-2)(x+2)} - \frac{1(x-2)}{(x-2)(x+2)}$$

$$\frac{x+2-x+2}{(x-2)(x+2)}$$

$$\frac{4}{x^2-4} \quad \textcircled{D}$$


⑥  $2x^2 - 5x + 3$      $\frac{-2}{-2} \times \frac{-3}{-3} = 6$   
 $\frac{-2}{-2} \times \frac{-3}{-3} = -5$   
 $(2x - 2)(-3x + 3)$   
 $2x(x-1) - 3(x-1)$   
 $(x-1)(2x-3)$   
 (B)

⑦  $x^2 - x - 6$      $\frac{-2}{-2} \times \frac{2}{2} = -6$   
 $\frac{-2}{-2} \times \frac{2}{2} = -1$   
 $x^2 - x - 6 = 0$   
 $(x-3)(x+2) = 0$   
 $x-3=0 \quad | \quad x+2=0$   
 $x=3 \quad | \quad x=-2$   
 (A)

⑧  $x^2 + 6x + 7$      $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$   
 $a=1$   
 $b=6$   
 $c=7$   
 $x = \frac{-6 \pm \sqrt{36 - 28}}{2}$   
 $x = \frac{-6 \pm \sqrt{8}}{2}$   
 $x = \frac{-6 \pm 2\sqrt{2}}{2} = \frac{-3 \pm \sqrt{2}}{1}$   
 (C)

⑨  $f(x) = 3x^4 - 7x^2 + 2x - 9$   
 $f(x) = 3(x^4) - 7(x^2) + 2(x) - 9$   
 $= 3x^4 - 7x^2 - 2x - 9$  (B)

⑩  $f(x) = x^2 + 2x + 5$   
 $f(x+h) = (x+h)^2 + 2(x+h) + 5$   
 $= x^2 + 2xh + h^2 + 2x + 2h + 5$  (D)

⑪  $(x-1)(x+2) \leq 0$   
 $y = (x-1)(x+2)$   
 $x \text{ int: } (y=0)$   
 $x = -2, 1$   
  
 (E)

⑫  $|x-3| \leq 5$   
 case 1: (+)  
 $+(x-3) \leq 5$   
 $x-3 \leq 5$   
 $x \leq 8$   
 case 2: (-)  
 $-(x-3) \leq 5$   
 $-x+3 \leq 5$   
 $-x \leq 2$   
 $x \geq -2$   
 $-2 \leq x \leq 8$  (C)

⑬  $8^{-\frac{1}{3}} \times 3^0$   
 $\left(\frac{1}{8}\right)^{\frac{1}{3}} \times 1$   
 $\sqrt[3]{\frac{1}{8}} \times 1$   
 $\frac{1}{2}$  (C)

⑭  $2^{-3} + 2^3$   
 $\left(\frac{1}{2}\right)^3 + 8$   
 $\frac{1}{8} + \frac{64}{8} = \frac{65}{8}$  (D)

$$(15) \quad a=16 \quad b=9$$

$$(a+b)^{-1/2}$$

$$(16+9)^{-1/2}$$

$$(25)^{-1/2}$$

$$\left(\frac{1}{25}\right)^{1/2}$$

$$\left(\frac{1}{5}\right) \quad (C)$$

$$(16) \quad \frac{1}{(8x^3)^{1/3}} \cdot (4x^2)^{1/2}$$

$$\frac{1}{2x} \cdot 2x$$

$$(1) \quad (C)$$

$$(17) \quad 2^x = 20$$

$$\log_2 20 = x$$

$$(E)$$

Logs are BAE  
 a  
 c  
 e  
 f  
 g  
 h  
 i  
 j  
 k  
 l  
 m  
 n  
 o  
 p  
 q  
 r  
 s  
 t  
 u  
 v  
 w  
 x  
 y  
 z

$$(18) \quad \log_{10} 4 + \log_{10} 5$$

$$\log_{10} (4 \times 5)$$

$$\log_{10} 20 \quad (B)$$

$$(19) \quad \log_3 81 = x$$

$$3^x = 81$$

$$3^x = 3^4$$

$$x = 4 \quad (A)$$

$$(20)$$

$$d = \sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$$

$$d = \sqrt{(9-7)^2 + (6-3)^2}$$

$$d = \sqrt{4+9}$$

$$d = \sqrt{13} \quad (B)$$



