No Calculator

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Top 20 ACT Prep Version 3

1. Simplify $1\frac{1}{2}+\frac{2}{7}$ *[39]*

$1\frac{1}{2}\to\frac{3}{2}$

$\frac{3}{2}+\frac{2}{7}\to\frac{3(7)}{2(7)}+\frac{2(2)}{2(7)}\to\frac{21+4}{14}\to\boxed{\frac{25}{14}}$

2. Solve $6x^2-10x-4=0$ *[85]*

$2(3x^2-5x-2)=0$

$3x^2-6x+1x-2=0$

$3x(x-2)+1(x-2)=0$

$(3x+1)(x-2)=0$

$3x+1=0$ $-1\ -1$ $3x=-1$ $\boxed{x=-1/3}$

$x-2=0$ $+2\ +2$ $\boxed{x=2}$

3. Find the midpoint given (1,4) & (3,8) *[218]*

$\frac{\Delta y}{2}=\frac{8-4}{2}=\frac{4}{2}=2$

$\frac{\Delta x}{2}=\frac{3-1}{2}=\frac{2}{2}=1$ $\boxed{\text{Midpoint}=(2,6)}$

$x+\Delta x=2$; $y+\Delta y=6$

4. Solve $\frac{A}{h}=\frac{1}{2}b\cdot h\ for\ b$ *[205]*

$\frac{1}{2}b=\frac{A}{h}$ $\frac{2}{h}$

$\boxed{b=\frac{2A}{h}}$

5. Simplify $\frac{15x^9y}{25x^2y}$ *[74]*

$\frac{3(5)x^7(x^2)(y)}{5(5)x^2(y)}\to\boxed{\frac{3x^7}{5}}$

6. Simplify $(3a+7n)^2$ *[221]*

$(3a+7n)(3a+7n)$

$9a^2+21an+21an+49n^2$

$\to\boxed{9a^2+42an+49n^2}$

7. Simplify $\frac{\frac{8}{2}}{7}$ *[50]*

$\frac{1}{8}\div\frac{2}{7}$

$\to\frac{1}{8}\cdot\frac{7}{2}=\boxed{\frac{7}{16}}$

8. Simplify (PEMDAS) $-1(x+5)^2+3$ *[212]*

$-1(x+5)(x+5)+3$

$-1(x^2+5x+5x+25)+3$

$-x^2-10x-25+3\to\boxed{-x^2-10x-22}$

9. Clear fractions, solve $\frac{3}{7}a+2=\frac{1}{3}$ *[207]*

$\frac{3}{7}a+\frac{6}{3}=\frac{1}{3}$ $-4/3\ \ -4/3$

$\frac{9}{7}a=-\frac{9}{3}$ $\cdot\frac{7}{9}\ \ \cdot\frac{7}{9}$

$3a=-\frac{35}{3}$

$3a=-\frac{35}{3}$ $\div3\ \ \div3$ $\boxed{a=-\frac{35}{9}}$

10. Simplify $(3a^3b^2)^2\cdot2(a^1b^2)$ *[206]*

$(3)^2a^{(3\cdot2)}b^{(2\cdot2)}\cdot2a^1b^2$

$9a^6b^4\cdot2a^1b^2$

$\boxed{18a^7b^6}$

11. Simplify $\frac{2\pm\sqrt{32}}{2}$ *[214]*

$\frac{2}{2}\pm\frac{\sqrt{32}}{2}$

$1\pm\frac{4\sqrt{2}}{2}$

$1\pm\sqrt{4\cdot2}$

$\boxed{1\pm2\sqrt{2}}$

12. Multiply $(x^2+2x-3)(x-5)$ *[59]*

$x^3-5x^2+2x^2-10x-3x+15$

$\boxed{x^3-3x^2-13x+15}$

13. Solve $(x+4)^2=15$ *[84]*

$\sqrt{(x+4)^2}=\sqrt{15}$

$x+4=\sqrt{16}$ $\boxed{x=-4\pm4}$

14. Simplify $\frac{2x^2+10x+12}{x^2-4}$ *[209]*

$\frac{2(x^2+5x+6)}{(x+2)(x-2)}\to\frac{2(x+3)(x+2)}{(x+2)(x-2)}\to\boxed{\frac{2(x+3)}{(x-2)}}$

15. Given $f(x)=-x^2-3x-2$, find f(-1) *[110]*

$f(-1)=-(-1)^2-3(-1)-2$

$=-(1)+3-2$

$\boxed{f(-1)=0}$

16. Write an equation using (-1,8) & (-2,-1)

[210] $m=\frac{\Delta y}{\Delta x}=\frac{8-(-1)}{-1-(-2)}=9$

$y=mx+b$

$-1=9(-2)+b$

$b=17$

$\boxed{y=9x+17}$

$\boxed{y+1=9(x+2)}$

$\boxed{y-8=9(x+1)}$

17. Simplify $\frac{2}{9}\cdot\frac{1}{6}$ *[42]*

$\frac{2(1)}{9}\cdot\frac{1}{2(3)}\to\boxed{\frac{1}{27}}$

18. Find the distance between (2,10) &(6,1)

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

$d=\sqrt{(6-2)^2+(1-10)^2}=\sqrt{4^2+9^2}\to\sqrt{97}$

19. Find 3 points on $f(x)=x^2-3x+1$ *[7]*

many possibilities

for ex) $f(0)=1\ \therefore(0,1)$

$f(1)=-1\ \therefore(1,-1)$

$f(2)=-1\ \therefore(2,-1)$

X	Y

20. Solve. Show 3+ steps of work *[89]*

$-(2x+2)-2(x-3)=9x+1$

$-2x-2-2x+6=9x+1$

$-4x+4=9x+1$

$3=13x$

$\boxed{x=3/13}$