4.2 Exercise Problems Linear Approximation

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Use the given information and a linear approximation to approximate the value of the function at c.

35) $f(2)=8 \quad f'(2)=-3 \quad c=2.06$

$y-8=-3(x-2)$

$y=-3(x-2)+8$

$y(2.06)=-3(2.06-2)+8$

$\boxed{y(2.06)=7.82}$

36) $f(-4)=3 \quad f'(-4)=2 \quad c=-3.6$

$y-3=2(x+4)$

$y=2(x+4)+3$

$y(-3.6)=2(-3.6+4)+3$

$\boxed{y(-3.6)=3.8}$

37) $f(-1)=0 \quad f'(-1)=\frac{3}{2} \quad c=-1.1$

$y-0=\frac{3}{2}(x+1)$

$y=\frac{3}{2}(x+1)$

$y(-1.1)=\frac{3}{2}(-1.1+1)$

$\boxed{y(-1.1)=-0.15}$

38) $f(5)=\frac{1}{2} \quad f'(5)=-3 \quad c=5.2$

$y-\frac{1}{2}=-3(x-5)$

$y=-3(x-5)+\frac{1}{2}$

$y(5.2)=-3(5.2-5)+\frac{1}{2}$

$\boxed{y(5.2)=-0.1}$